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NASA PATENT ABSTRACTS BIBLIOGRAPHY

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Section 1 • Abstracts

JULY 1985

NASA SP-7039(27) NASA Patent Abstracts Bibliography (Section 1 • Abstracts) JULY 1985

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NAS1.21:

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04) SEC 1	N69-20701 – N73-33931
NASA SP-7039(12) SEC 1	N74-10001 – N77-34042
NASA SP-7039(13) SEC 1	N78-10001 – N78-22018
NASA SP-7039(14) SEC 1	N78-22019 – N78-34034
NASA SP-7039(15) SEC 1	N79-10001 – N79-21993
NASA SP-7039(16) SEC 1	N79-21994 – N79-34158
NASA SP-7039(17) SEC 1	N80-10001 – N80-22254
NASA SP-7039(18) SEC 1	N80-22255 – N80-34339
NASA SP-7039(19) SEC 1	N81-10001 – N81-21997
NASA SP-7039(20) SEC 1	N81-21998 – N81-34139
NASA SP-7039(21) SEC 1	N82-10001 – N82-22140
NASA SP-7039(22) SEC 1	N82-22141 – N82-34341
NASA SP-7039(23) SEC 1	N83-10001 – N83-23266
NASA SP-7039(24) SEC 1	N83-23267 – N83-37053
NASA SP-7039(25) SEC 1	N84-10001 – N84-22526
NASA SP-7039(26) SEC 1	N84-22527 – N84-35284
NASA SP-7039(27) SEC 1	N85-10001 – N85-22341

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NASA SP-7039(27)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1985 and June 1985.

NASA Scientific and Technical Information Branch 1985
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NASA SP-7039(27) SEC 1 from the National Technical Information Service (NTIS), Springfield, Virginia 22161. For information regarding the purchase price (which is subject to change), please write or call NTIS at (703) 487-4650.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 92 citations published in this issue of the Abstract Section cover the period January 1985 through June 1985. The Index Section references over 4300 citations covering the period May 1969 through June 1985.

ABSTRACT SECTION (SECTION 1)

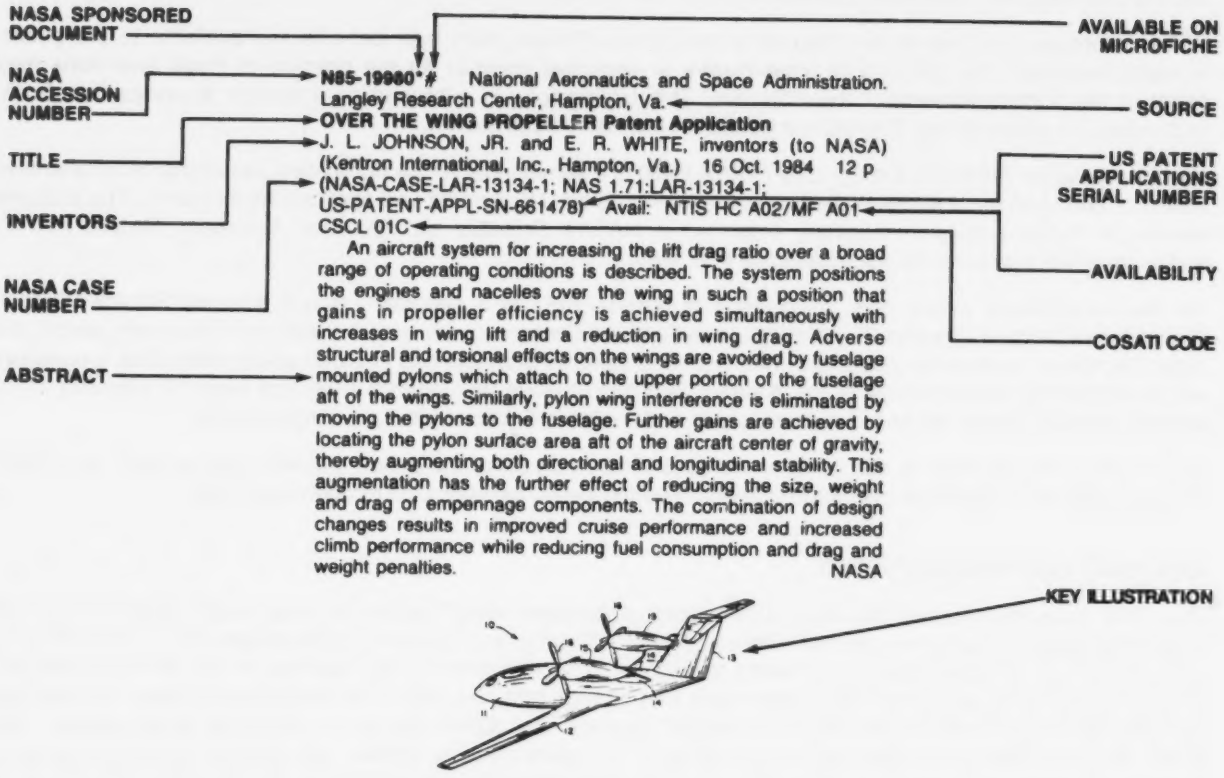
This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name
Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract are depicted in the Typical Citation and Abstract reproduced on the following page and are also used in the indexes.

TYPICAL CITATION AND ABSTRACT


NASA SPONSORED DOCUMENT
AVAILABLE ON MICROFICHE
NASA ACCESSION NUMBER
N85-19980* # National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
SOURCE
TITLE
OVER THE WING PROPELLER Patent Application
INVENTORS
J. L. JOHNSON, JR. and E. R. WHITE, inventors (to NASA)
(Kentron International, Inc., Hampton, Va.) 16 Oct. 1984 12 p
US PATENT APPLICATIONS SERIAL NUMBER
NASA CASE NUMBER
(NASA-CASE-LAR-13134-1; NAS 1.71:LAR-13134-1;
US-PATENT-APPL-SN-661478) Avail: NTIS HC A02/MF A01
AVAILABILITY
CSCL 01C
COSATI CODE
ABSTRACT
An aircraft system for increasing the lift drag ratio over a broad range of operating conditions is described. The system positions the engines and nacelles over the wing in such a position that gains in propeller efficiency is achieved simultaneously with increases in wing lift and a reduction in wing drag. Adverse structural and torsional effects on the wings are avoided by fuselage mounted pylons which attach to the upper portion of the fuselage aft of the wings. Similarly, pylon wing interference is eliminated by moving the pylons to the fuselage. Further gains are achieved by locating the pylon surface area aft of the aircraft center of gravity, thereby augmenting both directional and longitudinal stability. This augmentation has the further effect of reducing the size, weight and drag of empennage components. The combination of design changes results in improved cruise performance and increased climb performance while reducing fuel consumption and drag and weight penalties.
NASA
KEY ILLUSTRATION

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the NASA Accession Number.

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB*.

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB,* select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated invention(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02. Microfiche are sold at price code A01. The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB,* are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB.*

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: PT-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 279 Hampton, Virginia 23365 Telephone: (804)827-8725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-318 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AL3 Houston, Texas 77058 Telephone: (713)483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-801 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC: NASA and NASA-sponsored documents and a large number of aerospace publications are available to the public for reference purposes at the library maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN: An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England for public access. The British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols # and * from ESA — Information Retrieval Service European Space Agency, 8-10 rue Mario-Nikis, 75738 *CEDEX 15, France*.

FEDERAL DEPOSITORY LIBRARY PROGRAM

In order to provide the general public with greater access to U.S. Government publications, Congress established the Federal Depository Library Program under the Government Printing Office (GPO), with 50 regional depositories responsible for permanent retention of material, inter-library loan, and reference services. Over 1,300 other depositories also exists. A list of the regional GPO libraries appears on the inside back cover.

PATENT LICENSING REGULATIONS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

14 CFR Part 1245

Licensing of NASA Inventions

AGENCY: National Aeronautics and Space Administration.

ACTION: Interim regulation with comments requested.

SUMMARY: The National Aeronautics and Space Administration (NASA) is revising its patent licensing regulations to conform with Pub. L. 96-517. This interim regulation provides policies and procedures applicable to the licensing of federally owned inventions in the custody of the National Aeronautics and Space Administration, and implements Pub. L. 96-517. The object of this subpart is to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

EFFECTIVE DATE: July 1, 1981. Comments must be received in writing by December 2, 1981. Unless a notice is published in the **Federal Register** after the comment period indicating changes to be made, this interim regulation shall become a final regulation.

ADDRESS: Mr. John G. Mannix, Director of Patent Licensing, GP-4, NASA, Washington, D.C. 20546.

FOR FURTHER INFORMATION CONTACT:
Mr. John G. Mannix, (202) 755-3954.

SUPPLEMENTARY INFORMATION:

PART 1245—PATENTS AND OTHER INTELLECTUAL PROPERTY RIGHTS

Subpart 2 of Part 1245 is revised to read as follows:

* * * * *

Subpart 2—Licensing of NASA Inventions

Sec.

1245.200 Scope of subpart.
1245.201 Policy and objective.
1245.202 Definitions.
1245.203 Authority to grant licenses.

Restrictions and Conditions

1245.204 All licenses granted under this subpart.

Types of Licenses

1245.205 Nonexclusive licenses.
1245.206 Exclusive and partially exclusive licenses.

Procedures

1245.207 Application for a license.
1245.208 Processing applications.
1245.209 Notice to Attorney General.
1245.210 Modification and termination of licenses.
1245.211 Appeals.
1245.212 Protection and administration of inventions.
1245.213 Transfer of custody.
1245.214 Confidentiality of information.

Authority: 35 U.S.C. Section 207 and 208, 94 Stat. 3023 and 3024.

* * * * *

Subpart 2—Licensing of NASA Inventions

§ 1245.200 Scope of subpart.

This subpart prescribes the terms, conditions, and procedures upon which a NASA invention may be licensed. It does not affect licenses which (a) were in effect prior to July 1, 1981; (b) may exist at the time of the Government's acquisition of title to the invention, including those resulting from the allocation of rights to inventions made under Government research and development contracts, (c) are the result of an authorized exchange of rights in the settlement of patent disputes; or (d) are otherwise authorized by law or treaty.

§ 1245.201 Policy and objective.

It is the policy and objective of this subpart to use the patent system to promote the utilization of inventions arising from NASA supported research and development.

§ 1245.202 Definitions.

(a) "Federally owned invention" means an invention, plant, or design which is covered by a patent, or patent application in the United States, or a patent, patent application, plant variety protection, or other form of protection, in a foreign country, title to which has been assigned to or otherwise vested in the United States Government.

(b) "Federal agency" means an executive department, military department, Government corporation, or independent establishment, except the Tennessee Valley Authority, which has custody of a Federally owned invention.

(c) "NASA Invention" means a Federally owned invention with respect to which NASA maintains custody and administration, in whole or in part, of the right, title or interest in such invention on behalf of the United States Government.

(d) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of these regulations, the size standard for small business concerns involved in Government procurement, contained in 13 C.F.R. 121.3-8, and in subcontracting, contained in 13 CFR 121.3-12, will be used.

(e) Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

(f) "United States" means the United States of America, its territories and possessions, the District of Columbia, and the Commonwealth of Puerto Rico.

§ 1245.203 Authority to grant licenses.

NASA inventions shall be made available for licensing as deemed appropriate in the public interest. NASA may grant nonexclusive, partially exclusive, or exclusive licenses thereto under this subpart on inventions in its custody.

Restrictions and Conditions

§ 1245.204 All licenses granted under this subpart.

(a) *Restrictions.* (1) A license may be granted only if the applicant has supplied NASA with a satisfactory plan for development or marketing of the invention, or both, and with information about the applicant's capability to fulfill the plan.

(2) A license granting rights to use or sell under a NASA invention in the United States shall normally be granted only to a licensee who agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

(b) *Conditions.* Licenses shall contain such terms and conditions as NASA determines are appropriate for the protection of the interests of the Federal Government and the public and are not in conflict with law or this subpart. The following terms and conditions apply to any license:

(1) The duration of the license shall be for a period specified in the license agreement, unless sooner terminated in accordance with this subpart.

(2) The license may be granted for all or less than all fields of use of the invention or in specified geographical areas, or both.

(3) The license may extend to subsidiaries of the licensee or other parties if provided for in the license but shall be nonassignable without approval of NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(4) The license may provide the licensee the right to grant sublicenses under the license, subject to the approval of NASA. Each sublicense shall make reference to the license, including the rights retained by the Government, and a copy of such

sublicense shall be furnished to NASA.

(5) The license shall require the licensee to carry out the plan for development or marketing of the invention, or both, to bring the invention to practical application within a period specified in the license, and to continue to make the benefits of the invention reasonably accessible to the public.

(6) The license shall require the licensee to report periodically on the utilization or efforts at obtaining utilization that are being made by the licensee, with particular reference to the plan submitted.

(7) All licenses shall normally require royalties or other consideration.

(8) Where an agreement is obtained pursuant to § 1245.204(a)(2) that any products embodying the invention or produced through use of the invention will be manufactured substantially in the United States, the license shall recite such agreement.

(9) The license shall provide for the right of NASA to terminate the license, in whole or in part, if:

(i) NASA determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of NASA that it has taken or can be expected to take within a reasonable time effective steps to achieve practical application of the invention;

(ii) NASA determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee;

(iii) The licensee has willfully made a false statement of or willfully omitted a material fact in the license application or in any report required by the license agreement; or

(iv) The licensee commits a substantial breach of a covenant or agreement contained in the license.

(10) The license may be modified or terminated, consistent with this subpart, upon mutual agreement of NASA and the licensee.

(11) Nothing relating to the grant of a license, nor the grant itself, shall be construed to confer upon any person any immunity from or defenses under the antitrust laws or from a charge of patent misuse, and the acquisition and use of rights pursuant to this subpart shall not be immunized from the operation of state or Federal law by reason of the source of the grant.

Types of Licenses

§ 1245.205 Nonexclusive licenses.

(a) *Availability of licenses.* Nonexclusive licenses may be granted under NASA inventions without publication of availability or notice of a prospective license.

(b) *Conditions.* In addition to the provisions of § 1245.204, the nonexclusive license may also provide that, after termination of a period specified in the license agreement, NASA may restrict the license to the fields of use or geographic areas, or both, in which the licensee has brought the invention to practical application and continues to make the benefits of the invention reasonably accessible to the public. However, such restriction shall be made only in order to grant an exclusive or partially exclusive license in accordance with this subpart.

§ 1245.206 Exclusive and partially exclusive licenses.

(a) Domestic licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on NASA inventions: (i) 3 months after notice of the invention's availability has been announced in the **Federal Register**; or (ii) without such notice where NASA determines that expeditious granting of such a license will best serve the interests of the Federal Government and the public; and (iii) in either situation, specified in (a)(1)(i) or (ii) of this section only if:

(A) Notice of a prospective license, identifying the invention and the prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections within a 60-day period;

(B) After expiration of the period in § 1245.206(a) (1)(iii)(A) and consideration of nay written objections received during the period, NASA has determined that:

(*1*) The interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

(*2*) The desired practial application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention;

(*3*) Exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

(*4*) The proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public;

(C) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws; and

(D) NASA has given first preference to any small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and as equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to domestic exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall reserve to NASA the right to require the licensee to grant sublicenses to responsible applicants, on reasonable terms, when necessary to fulfill health or safety needs.

(iii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iv) The license may grant the licensee the right of enforcement of the licensed patent pursuant to the provisions of Chapter 29 of Title 35, United States Code, or other statutes, as determined appropriate in the public interest.

(b) Foreign licenses.

(1) *Availability of licenses.* Exclusive or partially exclusive licenses may be granted on a NASA invention covered by a foreign patent, patent application, or other form of protection, provided that:

(i) Notice of a prospective license, identifying the invention and prospective licensee, has been published in the **Federal Register**, providing opportunity for filing written objections

within a 60-day period and following consideration of such objections;

(ii) NASA has considered whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced; and

(iii) NASA has not determined that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

(2) *Conditions.* In addition to the provisions of § 1245.204, the following terms and conditions apply to foreign exclusive and partially exclusive licenses:

(i) The license shall be subject to the irrevocable, royalty-free right of the Government of the United States to practice and have practiced the invention on behalf of the United States and on behalf of any foreign government or international organization pursuant to any existing or future treaty or agreement with the United States.

(ii) The license shall be subject to any licenses in force at the time of the grant of the exclusive or partially exclusive license.

(iii) The license may grant the licensee the right to take any suitable and necessary actions to protect the licensed property, on behalf of the Federal Government.

(c) *Record of determinations.* NASA shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Procedures

§ 1245.207 Application for a license.

An application for a license should be addressed to the Patent Counsel at the NASA installation having responsibility for the invention and shall normally include:

(a) Identification of the invention for which the license is desired, including the patent application serial number or patent number, title, and date, if known;

(b) Identification of the type of license for which the application is submitted;

(c) Name and address of the person, company, or organization applying for the license and the citizenship or place of incorporation of the applicant;

(d) Name, address, and telephone number of representative of applicant to whom correspondence should be sent;

(e) Nature and type of applicant's business, identifying products or services which the applicant has successfully commercialized, and approximate number of applicant's employees;

(f) Source of information concerning the availability of a license on the invention;

(g) A statement indicating whether applicant is a small business firm as defined in § 1245.202(c);

(h) A detailed description of applicant's plan for development or marketing of the invention, or both, which should include:

(1) A statement of the time, nature and amount of anticipated investment of capital and other resources which applicant believes will be required to bring the invention to practical application;

(2) A statement as to applicant's capability and intention to fulfill the plan, including information regarding manufacturing, marketing, financial, and technical resources;

(3) A statement of the fields of use for which applicant intends to practice the invention; and

(4) A statement of the geographic areas in which applicant intends to manufacture any products embodying the invention and geographic areas where applicant intends to use or sell the invention, or both;

(i) Identification of licenses previously granted to applicant under Federally owned inventions;

(j) A statement containing applicant's best knowledge of the extent to which the invention is being practiced by private industry or Government, or both, or is otherwise available commercially; and

(k) Any other information which applicant believes will support a determination to grant the license to applicant.

§ 1245.208 Processing applications.

(a) Applications for licenses will be initially reviewed by the Patent Counsel of the NASA installation having responsibility for the invention. The Patent Counsel shall make a preliminary recommendation to the Director of Licensing, NASA Headquarters, whether to: (1) grant the license as requested, (2) grant the license with modification after negotiation with the licensee, or (3) deny the license. The Director of Licensing shall review the preliminary recommendation of the Patent Counsel and make a final recommendation to the NASA Assistant General Counsel for Patent Matters. Such review and final recommendation may include, and be based on, any additional information obtained from applicant and other sources that the Patent Counsel and the Director of Licensing deem relevant to the license requested. The determination to grant or deny the license shall be made by the Assistant General Counsel for Patent Matters based on the final recommendation of the Director of Licensing.

(b) When notice of a prospective exclusive or partially exclusive license is published in the Federal Register in accordance with § 1245.206(a)(1)(iii)(A) or § 1245.206(b)(1)(i), any written objections received in response thereto will be considered by the Director of Licensing in making the final recommendation to the Assistant General Counsel for Patent Matters.

(c) If the requested license, including any negotiated modifications, is denied by the Assistant General Counsel for Patent Matters, the applicant may request reconsideration by filing a written request for reconsideration within 30 days after receiving notice of denial. This 30-day period may be extended for good cause.

(d) In addition to, or in lieu of requesting reconsideration, the applicant may also appeal the denial of the license in accordance with § 1245.211.

§ 1245.209 Notice to Attorney General.

A copy of the notice provided for in §§ 1245.206(a)(1)(iii)(A), and 1245.206(b)(1)(i) will be sent to the Attorney General.

§ 1245.210 Modification and termination of licenses.

Before modifying or terminating a license, other than by mutual agreement, NASA shall furnish the licensee and any sublicensee of record a written notice of intention to modify or terminate the license, and the licensee and any sublicensee shall be allowed 30 days after such notice to remedy any breach of the license or show cause why the license should not be modified or terminated.

§ 1245.211 Appeals.

(a) The following parties may appeal to the NASA Administrator or designee any decision or determination concerning the grant, denial, interpretation, modification, or termination of a license:

(1) A person whose application for a license has been denied;

(2) A licensee whose license has been modified or terminated, in whole or in part; or

(3) A person who timely filed a written objection in response to the notice required by §§ 1245.206(a)(1)(iii)(A) or

1245.206(b)(1)(i) and who can demonstrate to the satisfaction of NASA that such person may be damaged by the Agency action.

(b) Written notice of appeal must be filed within 30 days (or such other time as may be authorized for good cause shown) after receiving notice of the adverse decision or determination; including, an adverse decision following the request for reconsideration under § 1245.206(c). The notice of appeal, along with all supporting documentation should be addressed to the Administrator, National Aeronautics and Space Administration, Washington. DC 20546. Should the appeal raise a genuine dispute over material facts, fact-finding will be conducted by the NASA Inventions and Contributions Board. The person filing the appeal shall be afforded an opportunity to be heard and to offer evidence in support of the appeal. The Chairperson of the Inventions and Contributions Board shall prepare written findings of fact and transmit them to the Administrator or designee. The decision on the appeal shall be made by the NASA Administrator or designee. There is no further right of administrative appeal from the decision of the Administrator or designee.

§ 1245.212 Protection and administration of inventions.

NASA may take any suitable and necessary steps to protect and administer rights to NASA inventions, either directly or through contract.

§ 1245.213 Transfer of custody.

NASA having custody of certain Federally owned inventions may transfer custody and administration in whole or in part, to another Federal agency, of the right, title, or interest in any such invention.

§ 1245.214 Confidentiality of information.

Title 35, United States Code, section 209, provides that any plan submitted pursuant to § 1245.207(h) and any report required by § 1245.204(b)(6) may be treated by NASA as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of Title 5 of the United States Code.

James M. Beggs,

Administrator.

October 15, 1981.

[FR Doc. 81-31000 Filed 10-30-81; 8:45 am]

BILLING CODE 7510-01-M

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

01 AERONAUTICS (GENERAL) **N.A.**

02 AERODYNAMICS **N.A.**
Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.
For related information see also *34 Fluid Mechanics and Heat Transfer*

03 AIR TRANSPORTATION AND SAFETY **N.A.**
Includes passenger and cargo air transport operations; and aircraft accidents.
For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation*.

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION **N.A.**
Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.
For related information see also *17 Spacecraft Communications, Command and Tracking* and *32 Communications*.

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE **1**
Includes aircraft simulation technology.
For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*.

06 AIRCRAFT INSTRUMENTATION **N.A.**
Includes cockpit and cabin display devices; and flight instruments.
For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

07 AIRCRAFT PROPULSION AND POWER **N.A.**
Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.
For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

08 AIRCRAFT STABILITY AND CONTROL **2**
Includes aircraft handling qualities; piloting; flight controls; and autopilots.

09 RESEARCH AND SUPPORT FACILITIES (AIR) **2**
Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.
For related information see also *14 Ground Support Systems and Facilities (Space)*.

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*

12 ASTRONAUTICS (GENERAL) **N.A.**
For extraterrestrial exploration see *91 Lunar and Planetary Exploration*.

13 ASTRODYNAMICS **N.A.**
Includes powered and free-flight trajectories; and orbit and launching dynamics.

14 GROUND SUPPORT SYSTEMS AND FACILITIES (SPACE) **N.A.**
Includes launch complexes, research and production facilities; ground support equipment, e.g., mobile transporters; and simulators.
For related information see also *09 Research and Support Facilities (Air)*.

15 LAUNCH VEHICLES AND SPACE VEHICLES **3**
Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

16 SPACE TRANSPORTATION **N.A.**
Includes passenger and cargo space transportation, e.g., shuttle operations; and rescue techniques.
For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation*.

17 SPACECRAFT COMMUNICATION, COMMAND AND TRACKING **N.A.**
Includes telemetry; space communications networks; astronavigation; and radio blackout.
For related information see also *04 Aircraft Communications and Navigation* and *32 Communications*.

18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE **N.A.**

Includes spacecraft thermal and environmental control; and attitude control.
For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics*.

19 SPACECRAFT INSTRUMENTATION **N.A.**
For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography*.

20 SPACECRAFT PROPULSION AND POWER **3**
Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.
For related information see also *07 Aircraft Propulsion and Power, 28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

23 CHEMISTRY AND MATERIALS (GENERAL) N.A.

Includes biochemistry and organic chemistry.

24 COMPOSITE MATERIALS 4

Includes laminates.

25 INORGANIC AND PHYSICAL CHEMISTRY 4

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics*.

26 METALLIC MATERIALS 5

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

27 NONMETALLIC MATERIALS 6

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

28 PROPELLANTS AND FUELS N.A.

Includes rocket propellants, igniters, and oxidizers; storage and handling; and aircraft fuels.

For related information see also *07 Aircraft Propulsion and Power*, *20 Spacecraft Propulsion and Power*, and *44 Energy Production and Conversion*.

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.

For related information see also *Physics*.

31 ENGINEERING (GENERAL) 10

Includes vacuum technology; control engineering; display engineering; and cryogenics.

32 COMMUNICATIONS 12

Includes land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking*.

33 ELECTRONICS AND ELECTRICAL ENGINEERING 13

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics*.

34 FLUID MECHANICS AND HEAT TRANSFER 15

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics*.

35 INSTRUMENTATION AND PHOTOGRAPHY 16

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources*. For related information see also *06 Aircraft Instrumentation* and *19 Spacecraft Instrumentation*.

36 LASERS AND MASERS 19

Includes parametric amplifiers.

37 MECHANICAL ENGINEERING 20

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

38 QUALITY ASSURANCE AND RELIABILITY N.A.

Includes product sampling procedures and techniques; and quality control.

39 STRUCTURAL MECHANICS N.A.

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance*.

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.

For related information see also *Space Sciences*.

42 GEOSCIENCES (GENERAL) N.A.

43 EARTH RESOURCES 22

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography*.

44 ENERGY PRODUCTION AND CONVERSION 23

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

For related information see also *07 Aircraft Propulsion and Power*, *20 Spacecraft Propulsion and Power*, *28 Propellants and Fuels*, and *85 Urban Technology and Transportation*.

45 ENVIRONMENT POLLUTION N.A.

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS 24

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

For space radiation see *93 Space Radiation*.

47 METEOROLOGY AND CLIMATOLOGY N.A.

Includes weather forecasting and modification.

48 OCEANOGRAPHY N.A.

Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

Includes sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

51 LIFE SCIENCES (GENERAL) **N.A.**
Includes genetics.

52 AEROSPACE MEDICINE **24**
Includes physiological factors; biological effects of radiation; and weightlessness.

53 BEHAVIORAL SCIENCES **N.A.**
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT **25**
Includes human engineering; biotechnology; and space suits and protective clothing.

55 PLANETARY BIOLOGY **N.A.**
Includes exobiology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) **N.A.**

60 COMPUTER OPERATIONS AND HARDWARE **26**
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

61 COMPUTER PROGRAMMING AND SOFTWARE **N.A.**
Includes computer programs, routines, and algorithms.

62 COMPUTER SYSTEMS **N.A.**
Includes computer networks.

63 CYBERNETICS **N.A.**
Includes feedback and control theory.
For related information see also *54 Man/System Technology and Life Support.*

64 NUMERICAL ANALYSIS **N.A.**
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY **N.A.**
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS **N.A.**
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS **N.A.**
Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

70 PHYSICS (GENERAL) **N.A.**
For geophysics see *46 Geophysics.* For astrophysics see *90 Astrophysics.* For solar physics see *92 Solar Physics.*

71 ACOUSTICS **26**
Includes sound generation, transmission, and attenuation.
For noise pollution see *45 Environment Pollution.*

72 ATOMIC AND MOLECULAR PHYSICS **N.A.**
Includes atomic structure and molecular spectra.

73 NUCLEAR AND HIGH-ENERGY PHYSICS **N.A.**
Includes elementary and nuclear particles; and reactor theory.
For space radiation see *93 Space Radiation.*

74 OPTICS **27**
Includes light phenomena.

75 PLASMA PHYSICS **N.A.**
Includes magnetohydrodynamics and plasma fusion.
For ionospheric plasmas see *46 Geophysics.* For space plasmas see *90 Astrophysics.*

76 SOLID-STATE PHYSICS **28**
Includes superconductivity.
For related information see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

77 THERMODYNAMICS AND STATISTICAL PHYSICS **N.A.**
Includes quantum mechanics; and Bose and Fermi statistics.
For related information see also *25 Inorganic and Physical Chemistry* and *34 Fluid Mechanics and Heat Transfer.*

SOCIAL SCIENCES

Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law and political science; and urban technology and transportation.

80 SOCIAL SCIENCES (GENERAL) **N.A.**
Includes educational matters.

81 ADMINISTRATION AND MANAGEMENT **N.A.**
Includes management planning and research.

82 DOCUMENTATION AND INFORMATION SCIENCE **N.A.**

Includes information storage and retrieval technology; micrography; and library science.

For computer documentation see *61 Computer Programming and Software*.

83 ECONOMICS AND COST ANALYSIS **N.A.**

Includes cost effectiveness studies.

84 LAW AND POLITICAL SCIENCE **N.A.**

Includes space law; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION **N.A.**

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

For related information see *03 Air Transportation and Safety*, *16 Space Transportation*, and *44 Energy Production and Conversion*.

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.

For related information see also *Geosciences*.

88 SPACE SCIENCES (GENERAL) **N.A.**

89 ASTRONOMY **N.A.**

Includes radio and gamma-ray astronomy; celestial mechanics; and astrometry.

90 ASTROPHYSICS **N.A.**

Includes cosmology; and interstellar and interplanetary gases and dust.

91 LUNAR AND PLANETARY EXPLORATION **N.A.**

Includes planetology; and manned and unmanned flights.

For spacecraft design see *18 Spacecraft Design, Testing and Performance*. For space stations see *15 Launch Vehicles and Space Vehicles*.

92 SOLAR PHYSICS **N.A.**

Includes solar activity, solar flares, solar radiation and sunspots.

93 SPACE RADIATION **N.A.**

Includes cosmic radiation; and inner and outer earth's radiation belts.

For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

GENERAL

99 GENERAL **N.A.**

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

SUBJECT INDEX
INVENTOR INDEX
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JULY 1985 (Supplement 27)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

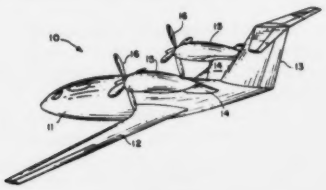
05

AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

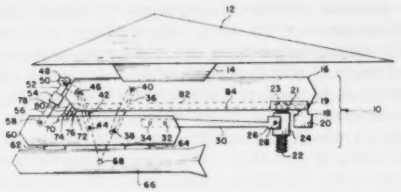
N85-19980*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
OVER THE WING PROPELLER Patent Application
J. L. JOHNSON, JR. and E. R. WHITE, inventors (to NASA) (Kentron International, Inc., Hampton, Va.) 16 Oct. 1984 12 p (NASA-CASE-LAR-13134-1; NAS 1.71:LAR-13134-1; US-PATENT-APPL-SN-661478) Avail: NTIS HC A02/MF A01 CSCL 01C

An aircraft system for increasing the lift drag ratio over a broad range of operating conditions is described. The system positions the engines and nacelles over the wing in such a position that gains in propeller efficiency is achieved simultaneously with increases in wing lift and a reduction in wing drag. Adverse structural and torsional effects on the wings are avoided by fuselage mounted pylons which attach to the upper portion of the fuselage aft of the wings. Similarly, pylon wing interference is eliminated by moving the pylons to the fuselage. Further gains are achieved by locating the pylon surface area aft of the aircraft center of gravity, thereby augmenting both directional and longitudinal stability. This augmentation has the further effect of reducing the size, weight and drag of empennage components. The combination of design changes results in improved cruise performance and increased climb performance while reducing fuel consumption and drag and weight penalties. NASA



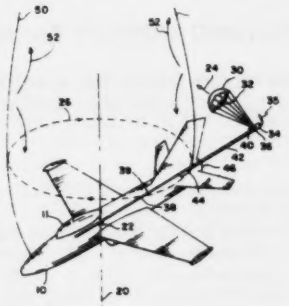
N85-19981*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
REMOTE PIVOT DECOUPLER PYLON: WING/STORE SUPPRESSION Patent Application
J. M. HASSLER, JR., inventor (to NASA) 10 Jan. 1985 16 p (NASA-CASE-LAR-13173-1; NAS 1.71:LAR-13173-1; US-PATENT-APPL-SN-690274) Avail: NTIS HC A02/MF A01 CSCL 01C

A device for suspending a store from an aerodynamic support surface, such as an aircraft wing, and more specifically, for improving upon singlet pivot decoupler pylons by reducing both frequency of active store, alignment and alignment system space and power requirements. Two links suspend a lower pylon/rack section, and releasable attached store from an upper pylon section mounted under wing. The links allow the lower pylon section to rotate in pitch about a remote pivot point. A leaf spring connected between the lower section and electrical alignment system servomechanism provides pitch alignment of the lower section/store combination. The servomechanism utilizes an electric servomotor to drive gear train and reversibly move the leaf spring, thereby maintaining the pitch attitude of store within acceptable limits. Damper strokes when lower section rotates to damp large oscillations of store. NASA



N85-21147* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
EXTENDED MOMENT ARM ANTI-SPIN DEVICE Patent
R. D. WHIPPLE, inventor (to NASA) 29 Jan. 1985 8 p Filed 27 Jun. 1983 Supersedes N83-29173 (21 - 18, p 2867) (NASA-CASE-LAR-12979-1; NAS 1.71:LAR-12979-1; US-PATENT-4,496,122; US-PATENT-APPL-SN-508371; US-PATENT-CLASS-244-75R; US-PATENT-CLASS-244-139; US-PATENT-CLASS-244-147) Avail: US Patent and Trademark Office CSCL 01C

A device which corrects aerodynamic spin is provided in which a collapsible boom extends an aircraft moment arm and an anti-spin parachute force is exerted upon the end of the moment arm to correct intentional or inadvertent aerodynamic spin. This configuration effects spin recovery by means of a parachute whose required diameter decreases as an inverse function of the increasing length of the moment arm. The collapsible boom enables the parachute to avoid the aircraft wake without mechanical assistance, retracts to permit steep takeoff, and permits a parachute to correct spin while minimizing associated aerodynamic, structural and in-flight complications.
Official Gazette of the U.S. Patent and Trademark Office



08

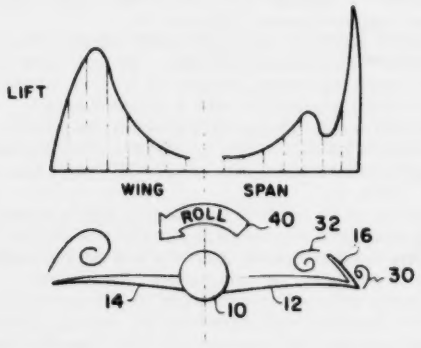
AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N85-19985* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LEADING EDGE FLAP SYSTEM FOR AIRCRAFT CONTROL AUGMENTATION Patent
D. M. RAO, inventor (to NASA) (Old Dominion Univ.) 4 Dec. 1984 9 p Filed 12 Aug. 1983 Continuation of abandoned US Patent Appl. SN-301078, filed 10 Sep. 1981 Sponsored by NASA (NASA-CASE-LAR-12787-2; NAS 1.71:LAR-12787-2; US-PATENT-4,485,992; US-PATENT-APPL-SN-5226628; US-PATENT-APPL-SN-301078; US-PATENT-CLASS-244-90R; US-PATENT-CLASS-244-214) Avail: US Patent and Trademark Office CSCL 01C

Traditional roll control systems such as ailerons, elevons or spoilers are least effective at high angles of attack due to boundary layer separation over the wing. This invention uses independently deployed leading edge flaps on the upper surfaces of vortex stabilized wings to shift the center of lift outboard. A rolling moment is created that is used to control roll in flight at high angles of attack. The effectiveness of the rolling moment increases linearly with angle of attack. No adverse yaw effects are induced. In an alternate mode of operation, both leading edge flaps are deployed together at cruise speeds to create a very effective airbrake without appreciable modification in pitching moment. Little trim change is required.

Official Gazette of the U.S. Patent and Trademark Office



09

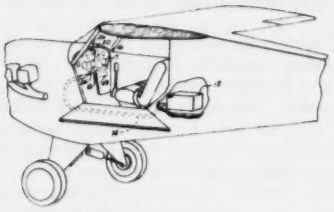
RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks.

N85-19990* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
INFLIGHT IFR PROCEDURES SIMULATOR Patent
L. C. PARKER, inventor (to NASA) 25 Dec. 1984 9 p Filed 11 Jun. 1982 Supersedes N82-29331 (20 - 20, p 2791) (NASA-CASE-KSC-11218-1; NAS 1.71:KSC-11218-1; US-PATENT-4,490,117; US-PATENT-APPL-SN-387649; US-PATENT-CLASS-434-35; US-PATENT-CLASS-434-49; US-PATENT-CLASS-434-242; US-PATENT-CLASS-434-243) Avail: US Patent and Trademark Office CSCL 14B

An inflight IFR procedures simulator for generating signals and commands to conventional instruments provided in an airplane is described. The simulator includes a signal synthesizer which generates predetermined simulated signals corresponding to signals normally received from remote sources upon being activated. A computer is connected to the signal synthesizer and causes the signal synthesizer to produce simulated signals responsive to programs fed into the computer. A switching network is connected to the signal synthesizer, the antenna of the aircraft, and navigational instruments and communication devices for selectively connecting instruments and devices to the synthesizer and disconnecting the antenna from the navigational instruments and communication device. Pressure transducers are connected to the altimeter and speed indicator for supplying electrical signals to the computer indicating the altitude and speed of the aircraft. A compass is connected for supply electrical signals for the computer indicating the heading of the airplane. The computer upon receiving signals from the pressure transducer and compass, computes the signals that are fed to the signal synthesizer which, in turn, generates simulated navigational signals.

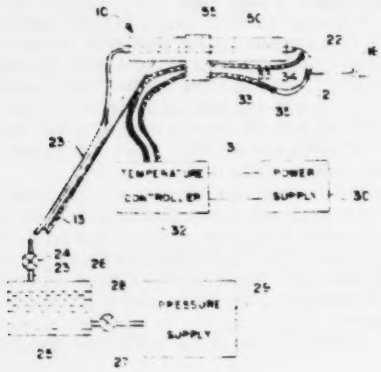
Official Gazette of the U.S. Patent and Trademark Office



N85-21178* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
CONTINUOUS LAMINAR SMOKE GENERATOR Patent
L. M. WEINSTEIN, inventor (to NASA) 15 Jan. 1985 7 p Filed 30 Aug. 1983 Supersedes N83-35158 (21 - 23, p 3772) (NASA-CASE-LAR-13014-1; NAS 1.71:LAR-13014-1; US-PATENT-4,493,211; US-PATENT-APPL-SN-527918; US-PATENT-CLASS-73-147) Avail: US Patent and Trademark Office CSCL 14B

A smoke generator capable of emitting a very thin, laminar stream of smoke for use in high detail flow visualization was invented. The generator is capable of emitting a larger but less stable rope of smoke. The invention consists of a pressure supply and fluid supply which supply smoke generating fluid to feed. The feed tube is directly heated by electrical resistance from current supplied by power supply and regulated by a constant temperature controller. A smoke exit hole is drilled in the wall of feed tube. Because feed tube is heated both before and past exit hole, no condensation of smoke generating occurs at the smoke exit hole, enabling the production of a very stable smoke filament. The

generator is small in size which avoids wind turbulence in front of the test model.
Official Gazette of the U.S. Patent and Trademark Office



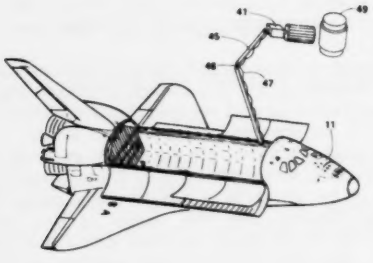
15

LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

N85-11122*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MAGNETIC SPIN REDUCTION SYSTEM FOR FREE SPINNING OBJECTS Patent Application
G. F. VONTIESENHAUSEN, inventor (to NASA) 23 Aug. 1984 13 p
(NASA-CASE-MFS-25966-1; NAS 1.71:MFS-25966-1; US-PATENT-APPL-SN-643522) Avail: NTIS HC A02/MF A01 CSCL 22B

A magnetic system and method is described for reducing the spin rate of a freely rotating or tumbling satellite. Spin reduction is accomplished by the recovery spacecraft having a mast carrying an electrical current carrying coil which encircles the satellite. The magnetic field of the coil is normal to the spin axis of the satellite which causes circular eddy current flow in the housing of the satellite which generates magnetic force opposing the rotation. In another embodiment the magnetic field is generated by the use of an electromagnet on a remote manipulation arm. NASA



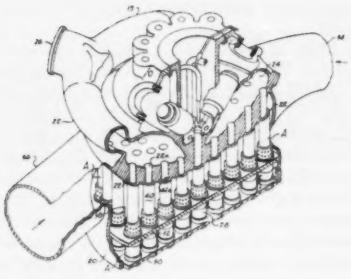
20

SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

N85-20008*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
LOW LOSS INJECTOR FOR LIQUID PROPELLANT ROCKET ENGINES Patent Application
G. L. VONPRAGENAU, inventor (to NASA) 10 Jan. 1985 16 p
(NASA-CASE-MFG-25989-1; NAS 1.71:MFG-25989-1; US-PATENT-APPL-SN-690273) Avail: NTIS HC A02/MF A01 CSCL 21H

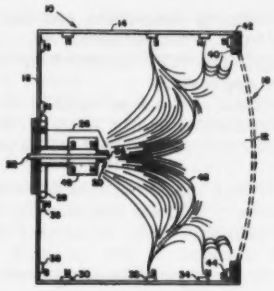
A low pressure loss injector element is disclosed for the main combustion chamber of a rocket engine which includes a lox post terminating in a cylindrical barrel. A lox plug received within the barrel which is threaded in the lox post and includes an interchangeable lox metering sieve which meters the lox into an annular lox passage. A second annular gas passage is coaxial with the annular lox passage. A cylindrical sieve surrounds the annular gas passage and includes an interchangeable gas metering sieve with metering orifices through which a hot gas passes into the annular passage. The jets which emerge from the annular lox passage and annular gas passage intersect at a point which is recessed away from the combustion area. The procedure enhances mixing and combustion stability. NASA



N85-21256* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RING-CUSP ION THRUSTER WITH SHELL ANODE Patent
J. S. SOVEY, V. K. RAWLIN, and R. F. ROMAN, inventors (to NASA) 21 Aug. 1984 6 p Filed 9 Mar. 1983 Supersedes N83-21903 (21 - 11, p 1783)
(NASA-CASE-LEW-13881-1; NAS 1.71:LEW-13881-1; US-PATENT-4,466,242; US-PATENT-APPL-SN-473498; US-PATENT-CLASS-60-202) Avail: US Patent and Trademark Office CSCL 21C

An improved ion thruster for low specific impulse operation in the 1500 sec to 6000 sec range has a multicusp boundary field provided by high strength magnets on an iron anode shell which

lengthens the paths of electrons from a hollow cathode assembly. A downstream anode pole piece in the form of an iron ring supports a ring of magnets to provide a more uniform beam profile. A cylindrical cathode magnet can be moved selectively in an axial direction along a feed tube to produce the desired magnetic field at the cathode tip. Author



24

COMPOSITE MATERIALS

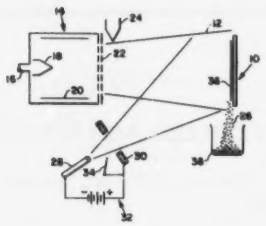
Includes laminates.

N85-21266* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMAL BARRIER COATING SYSTEM Patent
S. STECURA, inventor (to NASA) 27 Nov. 1984 7 p Filed 16 Aug. 1983 Supersedes N83-34014 (21 - 22, p 3601) Continuation-in-part of abandonded US Patent Appl. SN-375784, filed 6 May 1982
(NASA-CASE-LEW-13324-2; NAS 1.71:LEW-13324-2; US-PATENT-4,485,151; US-PATENT-APPL-SN-523297; US-PATENT-CLASS-428-633; US-PATENT-CLASS-428-656; US-PATENT-CLASS-428-678; US-PATENT-CLASS-428-679; US-PATENT-CLASS-428-680; US-PATENT-CLASS-428-681; US-PATENT-CLASS-428-682; US-PATENT-CLASS-428-683; US-PATENT-CLASS-428-684; US-PATENT-APPL-SN-375784) Avail: US Patent and Trademark Office CSCL 11D

A high temperature oxidation resistant, thermal barrier coating system is disclosed for a nickel cobalt, or iron base alloy substrate. An inner metal bond coating contacts the substrate, and a thermal barrier coating covers the bond coating. NiCrAlR, FeCrAlR, and CoCrAlR alloys are satisfactory as bond coating compositions where R=Y or Yb. These alloys contain, by weight, 24.9-36.7% chromium, 5.4-18.5% aluminum, and 0.05 to 1.55% yttrium or 0.05 to 0.53% ytterbium. The coatings containing ytterbium are preferred over those containing yttrium. An outer thermal barrier coating of partial stabilized zirconium oxide (zirconia) which is between 6% and 8%, by weight, of yttrium oxide (yttria) covers the bond coating. Partial stabilization provides a material with superior durability. Partially stabilized zirconia consists of mixtures of cubic, tetragonal, and monoclinic phases.
Official Gazette of the U.S. Patent and Trademark Office

N85-21267* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DIAMONDLIKE FLAKES Patent
B. A. BANKS, inventor (to NASA) 22 Jan. 1985 6 p Filed 19 Mar. 1984 Supersedes N84-22696 (22 - 13, p 1953) Continuation-in-part of US Patent-4,437,962, US Patent Appl. SN-495381, filed 17 May 1983
(NASA-CASE-LEW-13837-2; NAS 1.71:LEW-13837-2; US-PATENT-4,495,044; US-PATENT-APPL-SN-591089; US-PATENT-CLASS-204-192C; US-PATENT-CLASS-204-192R; US-PATENT-CLASS-204-192N; US-PATENT-CLASS-423-445; US-PATENT-CLASS-423-446; US-PATENT-CLASS-423-449; US-PATENT-CLASS-427-39; US-PATENT-4,437,962; US-PATENT-APPL-SN-495381) Avail: US Patent and Trademark Office CSCL 11D

A carbon coating was vacuum arc deposited on a smooth surface of a target which was simultaneously ion beam sputtered. The bombarding ions have sufficient energy to create diamond bonds. Spalling occurs as the carbon deposit thickens. The resulting diamond like carbon flakes improve thermal, electrical, mechanical, and tribological properties when used in aerospace structures and components.
Official Gazette of the U.S. Patent and Trademark Office



25

INORGANIC AND PHYSICAL CHEMISTRY

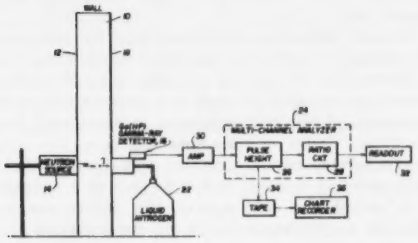
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N85-21279* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD AND APPARATUS FOR MAPPING THE DISTRIBUTION OF CHEMICAL ELEMENTS IN AN EXTENDED MEDIUM Patent
L. G. EVANS (Computer Sciences Corp., Greenbelt, Md.) and J. I. TROMBKA, inventors (to NASA) (Computer Sciences Corp., Greenbelt, Md.) 20 Nov. 1984 11 p Filed 31 Jan. 1983 Supersedes N83-20446 (21 - 10, p 1567) Sponsored by NASA
(NASA-CASE-GSC-12808-1; NAS 1.71:GSC-12808-1; US-PATENT-4,483,817; US-PATENT-APPL-SN-462497; US-PATENT-CLASS-376-159) Avail: US Patent and Trademark Office CSCL 07D

Contaminants in an extended medium such as the wall of a building are mapped by locating neutron excitation source on one side of the wall and a gamma ray spectrometer, including a gamma ray detector on the opposite side of the wall facing the excitation source. The source and detector are moved in unison in discrete steps over opposing wall surfaces so as to determine the chemical composition of the elements in a hemispheric region of the wall adjacent the detector with the radius of the region being substantially that of the mean free path distance of gamma rays emitted from elements interacting with neutrons on the detector side of the wall. The source and detector are reversed for relatively thick walls for mapping the distribution of elements on the other side of the wall thickness. The output of the detector is fed to a

multichannel pulse height analyzer where the intensity of the various gamma ray spectral lines are indicated relative to a dominant constituent element such as silicon. Resolution of anomalies such as the presence of voids and/or determining the bulk density of the medium is achieved by substituting a gamma ray source technique is also applied to metal alloys, such as iron alloys, in either the solid or molten state.

Official Gazette of the U.S. Patent and Trademark Office



N85-21280* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PROCESS FOR PRODUCING TRIS S(N-METHYLAMINO) METHYLSILANE Patent

J. M. CLEMONS, B. G. PENN, and F. E. LEDBETTER, III, inventors (to NASA) 2 Oct. 1984 5 p Filed 9 May 1983 Supersedes N83-25811 (21 - 15, p 2364)

(NASA-CASE-MFS-25721-1; NAS 1.71:MFS-25721-1; US-PATENT-4,474,975; US-PATENT-APPL-SN-492964; US-PATENT-CLASS-556-410) Avail: US Patent and Trademark Office CSCL 07D

A method of producing tris (N-methylamine) methylsilane is described including the steps of forming and cooling a liquid solution of methylamine in an inert solvent and under an inert atmosphere at a temperature of about -30 C and slowly adding a quantity of methyltricholorosilane while maintaining said temperature. The reaction mixture is then heated for about 60 minutes at a temperature of about 40 C, followed by filtering the solid portion from the liquid portion. The liquid is distilled to remove the solvent, resulting in a high yield of tris (N-methylamine) methylsilane.

Official Gazette of the U.S. Patent and Trademark Office

26

METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

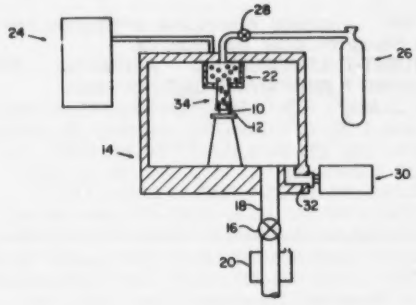
N85-21324*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ION-BEAM NITRIDING OF STEELS Patent Application

J. SALIK and T. E. HUBBELL, JR., inventors (to NASA) 16 Oct. 1984 12 p

(NASA-CASE-LEW-14104-1; NAS 1.71:LEW-14104-1; US-PATENT-APPL-SN-661481) Avail: NTIS HC A02/MF A01 CSCL 11F

A surface of a steel substrate is nitrided by exposing it to a beam of nitrogen ions under a low pressure. The pressure is much lower than that employed for ion-nitriding, and an ion source is used instead of a glow discharge. Both of these feathers reduce the introduction of impurities into the substrate surface. NASA



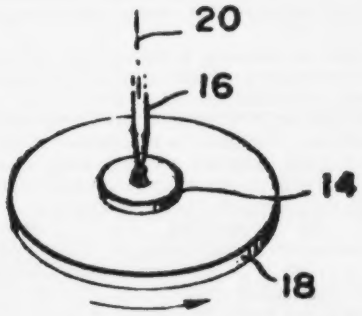
N85-21325*# National Aeronautics and Space Administration. Pasadena Office, Calif.

A PROCESS TO PRODUCE FINE LINE METALLIC COLLECTION PATTERNS ON SEMICONDUCTORS DEVICES Patent Application

B. D. GALLAGHER, inventor (to NASA) 20 Dec. 1984 13 p (Contract NAS7-918)

(NASA-CASE-NPO-16413-1; NAS 1.71:NPO-16413-1; US-PATENT-APPL-SN-648185) Avail: NTIS HC A02/MF A01 CSCL 11F

A method is described for forming thin conductive metal lines on a nonmetallic substrate. A metallizable compound is applied to the substrate in a substantially uniform thin film. Heating radiation is applied to the film along a plurality of separated fine lines, but not to the area between the lines, to heat the film along said lines to a temperature at which the metallizable compound is converted to a metal and gases that drift away. A solvent is then applied to the film to wash away the areas that have not been metallized. NASA



27

NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N85-20123* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THERMOSET-THERMOPLASTIC AROMATIC POLYAMIDE CONTAINING N-PROPARGYL GROUPS Patent
T. L. ST.CLAIR, J. F. WOLFE (Virginia Polytechnic Inst. and State Univ.), and T. D. GREENWOOD, inventors (to NASA) (Virginia Polytechnic Inst. and State Univ.) 26 Jul. 1983 5 p Filed 23 Oct. 1980 Supersedes N81-15107 (19 - 06, p 0727)
(NASA-CASE-LAR-12723-1; NAS 1.71:LAR-12723-1;
US-PATENT-4,395,540; US-PATENT-APPL-SN-199768;
US-PATENT-CLASS-528-345; US-PATENT-CLASS-525-420;
US-PATENT-CLASS-528-183; US-PATENT-CLASS-528-192;
US-PATENT-CLASS-528-220; US-PATENT-CLASS-528-336)
Avail: US Patent and Trademark Office CSCL 11B

A composition and method are disclosed for increasing the use temperature of polyamides based on the incorporation of a latent crosslinking agent into the polymer backbone, wherein high temperature performance is achieved without sacrificing solubility or processability.

Official Gazette of the U.S. Patent and Trademark Office

N85-20124* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS FOR PREPARING SOLVENT RESISTANT, THERMOPLASTIC AROMATIC POLY(IMIDESULFONE) Patent
T. L. ST.CLAIR and D. A. YAMAKI, inventors (to NASA) 18 Dec. 1984 6 p Filed 6 May 1983 Supersedes N83-29391 (21 - 18, p 2900) Division of US Patent No. 4,398,021, US Patent Appl. SN-407240, filed 11 Aug. 1981
(NASA-CASE-LAR-12858-2; NAS 1.71:LAR-12858-2;
US-PATENT-4,489,027; US-PATENT-4,398,021;
US-PATENT-APPL-SN-492282; US-PATENT-APPL-SN-407240;
US-PATENT-CLASS-264-137; US-PATENT-CLASS-264-112;
US-PATENT-CLASS-264-120; US-PATENT-CLASS-264-152;
US-PATENT-CLASS-264-258; US-PATENT-CLASS-264-331.12;
US-PATENT-CLASS-264-331.19; US-PATENT-CLASS-264-DIG.65;
US-PATENT-CLASS-528-226; US-PATENT-CLASS-528-239;
US-PATENT-CLASS-528-241; US-PATENT-CLASS-528-258;
US-PATENT-CLASS-528-279) Avail: US Patent and Trademark Office CSCL 11B

A process for preparing a thermoplastic poly(midesulfone) is disclosed. This resulting material has thermoplastic properties which are generally associated with polysulfones but not polyimides, and solvent resistant which is generally associated with polyimides but not polysulfones. This system is processable in the 250 to 350 C range for molding, adhesive and laminating applications. This unique thermoplastic poly(imidesulfone) is obtained by incorporating an aromatic sulfone moiety into the backbone of an aromatic linear polyimide by dissolving a quantity of a 3,3',4,4'-benzophenonetetracarboxylic dianhydride (BTDA) in a solution of 3,3'-diaminodiphenylsulfone and bis(2-methoxyethyl)ether, precipitating the reactant product in water, filtering and drying the recovered poly(amide-acid sulfone) and converting it to the poly(imidesulfone) by heating.

Official Gazette of the U.S. Patent and Trademark Office

N85-20125* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HOT MELT ADHESIVE ATTACHMENT PAD Patent
R. L. FOX, A. W. FRIZZILL, B. D. LITTLE, D. J. PROGAR, R. H. COULTRIP, R. H. COUCH, J. R. GLEASON, B. A. STEIN, J. D. BUCKLEY, and T. L. ST.CLAIR, inventors (to NASA) 18 Dec. 1984 10 p Filed 22 Jul. 1983 Supersedes N83-34044 S(21 - 22, p 3605)
(NASA-CASE-LAR-12894-1; NAS 1.71:LAR-12894-1;
US-PATENT-4,488,335; US-PATENT-APPL-SN-516087;
US-PATENT-CLASS-24-304; US-PATENT-CLASS-24-447;
US-PATENT-CLASS-24-450; US-PATENT-CLASS-24-693;
US-PATENT-CLASS-156-273.7) Avail: US Patent and Trademark Office CSCL 11A

A hot melt adhesive attachment pad for releasably securing distinct elements together is described which is particularly useful in the construction industry or a spatial vacuum environment. The attachment pad consists primarily of a cloth selectively impregnated with a charge of hot melt adhesive, a thermo-foil heater, and a thermo-cooler. These components are securely mounted in a mounting assembly. In operation, the operator activates the heating cycle transforming the hot melt adhesive to a substantially liquid state, positions the pad against the attachment surface, and activates the cooling cycle solidifying the adhesive and forming a strong, releasable bond.

Official Gazette of the U.S. Patent and Trademark Office

N85-20126* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
INSULATION BONDING TEST SYSTEM Patent
J. M. BEGGS, G. D. JOHNSTON, A. D. COLEMAN, J. N. PORTWOOD, J. M. SAUNDERS, J. W. REDMON, and A. C. PORTER, inventors (to NASA) (Teledyne Brown Engineering Co., Huntsville, Ala.) 30 Oct. 1984 9 p Filed 10 Feb. 1983 Supersedes N83-19903 (21 - 10, p 1489)
(NASA-CASE-MFS-25862-1; NAS 1.71:MFS-25862-1;
US-PATENT-4,479,386; US-PATENT-APPL-SN-465366;
US-PATENT-CLASS-73-582; US-PATENT-CLASS-73-579;
US-PATENT-CLASS-73-588) Avail: US Patent and Trademark Office CSCL 11G

A method and a system for testing the bonding of foam insulation attached to metal is described. The system involves the use of an impacter which has a calibrated load cell mounted on a plunger and a hammer head mounted on the end of the plunger. When the impacter strikes the insulation at a point to be tested, the load cell measures the force of the impact and the precise time interval during which the hammer head is in contact with the insulation. This information is transmitted as an electrical signal to a load cell amplifier where the signal is conditioned and then transmitted to a fast Fourier transform (FFT) analyzer. The FFT analyzer produces energy spectral density curves which are displayed on a video screen. The termination frequency of the energy spectral density curve may be compared with a

predetermined empirical scale to determine whether a igh quality bond, good bond, or debond is present at the point of impact.
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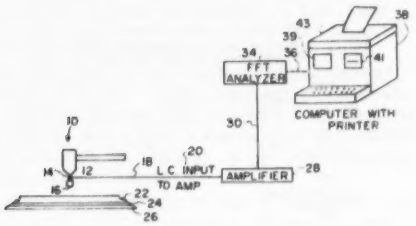
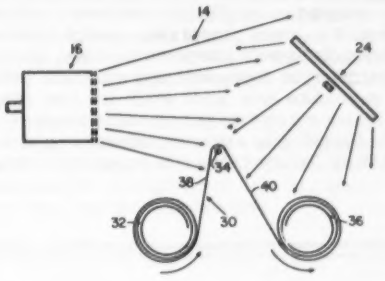


between reels. The ion beam irst cleans the polymer material surface and then sputters the film material from a target onto this surface.
NASA



N85-20128*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS FOR PREPARING ESSENTIALLY COLORLESS POLYIMIDE FILM CONTAINING PHENOXY-LINKED DIAMINES Patent Application
A. K. ST.CLAIR and T. L. ST.CLAIR, inventors (to NASA) 23 Aug. 1984 23 p
(NASA-CASE-LAR-13353-1; NAS 1.71:LAR-13353-1; US-PATENT-APPL-SN-643524) Avail: NTIS HC A02/MF A01 CSCL 11B

A polyimide film that is approximately 90% transparent at 500 nm, useful for thermal protective coatings and solar cells, and the processes for preparing the same by thermal and chemical conversion are disclosed. An essential feature for achieving maximum optical transparency films requires utilizing recrystallized and/or sublimated specific aromatic diamines and dianhydride monomers and introducing phenoxy or thiophenyl separator groupps and isomeric m,m'- or o,p'-oriented diamines into the polymer molecular structure. The incorporation of these groups in the polymer structure serves to separate the chromaphoric centers and reduce the formation of inter-chain and intra-chain charge transfer complexes which normally cause absorptions in the UV-visible range. The films may be obtained by hand, brushing, casting or spraying a layer of the polyamic acid solutions onto a surface and thermally converting the applied layer to the polyimide. In addition, the polyamic acid solution can be chemically converted to the polyimide, subsequentially dissolved in an organic solvent, and applied as a polyimide film layer with the solvent therein thermally removed.
NASA

N85-20129*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OXIDATION PROTECTION COATINGS FOR POLYMERS Patent Application
M. J. MIRTICH, B. A. BANKS, and J. S. SOVEY, inventors (to NASA) 11 Sep. 1984 11 p
(NASA-CASE-LEW-14072-1; NAS 1.71:LEW-14072-1; US-PATENT-APPL-SN-649330) Avail: NTIS HC A02/MF A01 CSCL 11B

A polymeric substrate is coated with a metal oxide film to provide oxidation protection in low earth orbital environments. The film contains about 4 volume percent polymer to provide flexibility. A coil of polymer material moves through an ion beam as it is fed

N85-21347* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHOSPHORUS-CONTAINING IMIDE RESINS Patent
I. K. VARMA (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER, inventors (to NASA) 29 Jan. 1985 7 p Filed 9 Jun. 1983 Division of US Patent Appl. SN-288267, US Patent-4,395,557, filed 30 Jul. 1981, which is a continuation-in-part of US Patent Appl. SN-175452, US Patent-4,276,344, filed 5 Aug. 1980
(NASA-CASE-ARC-11368-2; NAS 1.71:ARC-11368-2; US-PATENT-4,496,701; US-PATENT-4,395,557; US-PATENT-4,276,344; US-PATENT-APPL-SN-502820; US-PATENT-APPL-SN-288267; US-PATENT-APPL-SN-175452; US-PATENT-CLASS-526-262; US-PATENT-CLASS-526-274; US-PATENT-CLASS-528-167; US-PATENT-CLASS-528-168; US-PATENT-CLASS-528-170; US-PATENT-CLASS-528-321; US-PATENT-CLASS-528-322) Avail: US Patent and Trademark Office CSCL 11B

Cured polymers of bis and tris-imides derived from tris(m-aminophenyl) phosphine oxides by reaction with maleic anhydride or its derivatives, and addition polymers of such imides, including a variant in which a monoimide is condensed with a dianhydride and the product is treated with a further quantity of maleic anhydride prior to curing are disclosed and claimed. Such polymers are flame resistant. Also disclosed are an improved method of producing tris(m-aminophenyl) phosphine oxides from the nitro analogues by reduction with hydrazine hydrate using palladized charcoal or Raney nickel as the catalyst and fiber reinforced cured resin composites.
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N85-21348* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHTHALOCYANINE POLYMERS Patent
B. N. ACHAR (NAS-NRS, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER, inventors (to NASA) 12 Feb. 1985 14 p Filed 10 Nov. 1982 Supersedes N83-14275 (21 - 05, p 0643)
(NASA-CASE-ARC-11413-1; US-PATENT-4,499,260; US-PATENT-APPL-SN-440656; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-125; US-PATENT-CLASS-528-126; US-PATENT-CLASS-528-128; US-PATENT-CLASS-528-166; US-PATENT-CLASS-528-185; US-PATENT-CLASS-528-186;

US-PATENT-CLASS-528-187; US-PATENT-CLASS-528-226; US-PATENT-CLASS-528-352; US-PATENT-CLASS-528-353)
Avail: US Patent and Trademark Office CSCL 07D

A method of forming 4,4',4'',4''' -tetraamino phthalocyanines involves reducing 4,4',4'',4''' -tetranitro phthalocyanines, polymerizing the metal tetraamino phthalocyanines with a tetracarboxylic dianhydride (preferably aromatic) or copolymerizing with a tetracarboxylic dianhydride and a diamine (preferably also aromatic) to produce amic acids which are then dehydrocyclized to imides. Thermally and oxidatively stable polymers result which form tough, flexible films, varnishes, adhesives, and fibers.

Official Gazette of the U.S. Patent and Trademark Office

N85-21349* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ELASTOMER TOUGHENED POLYIMIDE ADHESIVES Patent

A. K. ST.CLAIR and T. L. ST.CLAIR, inventors (to NASA) 5 Feb. 1985 7 p Filed 28 Jan. 1983 Supersedes N83-29390 (21 - 18, p 2900) Division of US Patent No. 4,389,504, US Patent Appl. SN-308201, filed 2 Oct. 1981
(NASA-CASE-LAR-12775-2; NAS 1.71:LAR-12775-2; US-PATENT-4,497,935; US-PATENT-APPL-SN-461788; US-PATENT-CLASS-525-181; US-PATENT-CLASS-525-182; US-PATENT-CLASS-525-183; US-PATENT-CLASS-525-184; US-PATENT-CLASS-525-474; US-PATENT-4,389,504; US-PATENT-APPL-SN-308201) Avail: US Patent and Trademark Office CSCL 11A

A rubber-toughened, addition-type polyimide composition is disclosed which has excellent high temperature bonding characteristics in the fully cured state and improved peel strength and adhesive fracture resistance physical property characteristics. The process for making the improved adhesive involves preparing the rubber-containing amic acid prepolymer by chemically reacting an amine-terminated elastomer and an aromatic diamine with an aromatic dianhydride with which a reactive chain stopper anhydride has been mixed, and utilizing solvent or mixture of solvents for the reaction.

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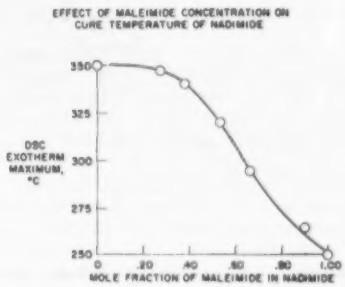
N85-21350* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE WITH MALEIMIDE Patent

R. W. LAUVER, inventor (to NASA) 5 Feb. 1985 9 p Filed 14 Dec. 1983 Supersedes N84-22698 (22 - 13, p 1953) Division of US Patent Appl. SN-516217, filed 22 Jul. 1983
(NASA-CASE-LEW-13770-3; NAS 1.71:LEW-13770-3; US-PATENT-4,497,948; US-PATENT-APPL-SN-561431; US-PATENT-CLASS-528-342; US-PATENT-CLASS-526-217; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-315; US-PATENT-CLASS-528-322; US-PATENT-CLASS-528-336; US-PATENT-APPL-SN-516217)
Avail: US Patent and Trademark Office CSCL 07D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. Control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymers, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the availability of the maleic-capped reactant.

Author



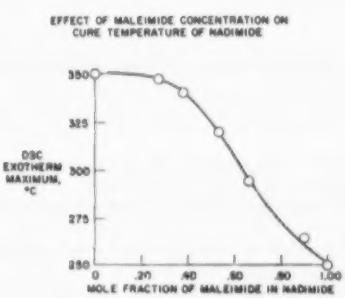
N85-21351* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE WITH MALEIMIDE Patent

R. W. LAUVER, inventor (to NASA) 5 Feb. 1985 9 p Filed 14 Dec. 1983 Supersedes N84-22699 (22 - 13, p 1953) Division of US Patent Appl. SN-516217, filed 22 Jul. 1983
(NASA-CASE-LEW-13770-4; NAS 1.71:LEW-13770-4; US-PATENT-4,497,939; US-PATENT-APPL-SN-561429; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-322; US-PATENT-CLASS-528-342; US-PATENT-APPL-SN-516217) Avail: US Patent and Trademark Office CSCL 07D

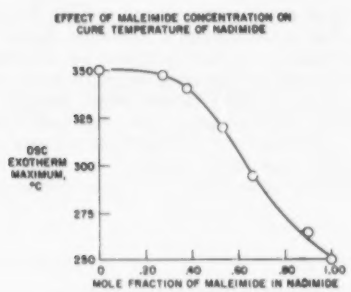
Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic end-capped reactant. This control can be achieved by adding sufficient amounts of said maleic reactant, or by chemical modification of either copolymer, so as to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or holding initiation and polymerization to a rate compatible with the available of the maleic-capped reactant.

Author



N85-21352* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHEMICAL APPROACH FOR CONTROLLING NADIMIDE CURE TEMPERATURE AND RATE Patent
R. W. LAUVER, inventor (to NASA) 5 Feb. 1985 8 p Filed 14 Dec. 1983 Supersedes N84-22700 (22 - 13, p 1953) Division of US Patent Appl. SN-516217, filed 22 Jul. 1983
(NASA-CASE-LEW-13770-5; NAS 1.71:LEW-13770-5; US-PATENT-4,497,940; US-PATENT-APPL-SN-561435; US-PATENT-CLASS-526-262; US-PATENT-CLASS-528-229; US-PATENT-CLASS-528-322; US-PATENT-CLASS-528-342; US-PATENT-APPL-SN-516217) Avail: US Patent and Trademark Office CSCL 07D

Polyimide resins suitable for use as composite matrix materials are formed by copolymerization of maleic and norbornenyl endcapped monomers and oligomers. The copolymers can be cured at temperatures under about 300 C by controlling the available concentration of the maleic endcapped reactant. This control is achieved by adding sufficient amounts of said maleic reactant or by chemical modification of either copolymer, to either increase Diels-Alder retrogression of the norbornenyl capped reactant and/or hold initiation and polymerization to a rate compatible with the availability of the maleic capped reactant.
Official Gazette of the U.S. Patent and Trademark Office



N85-21360*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS FOR PREPARING HIGHLY OPTICALLY TRANSPARENT-COLORLESS ARMOMATIC POLYIMIDE FILM Patent Application
A. K. ST.CLAIR and T. L. ST.CLAIR, inventors (to NASA) 23 Aug. 1984 21 p
(NASA-CASE-LAR-13351-1; NAS 1.71:LAR-13351-1; US-PATENT-APPL-SN-643589) Avail: NTIS HC A02/MF A01 CSCL 11B

An aromatic condensation polyimide film that is approximately 90% transparent at 500 nm, useful for thermal protective coatings and the process for preparing same are disclosed. A feature to achieve maximum optical transparency films requires the utilization of recrystallized and/or sublimated specific aromatic diamines and dianhydride monomers and introduction bulky electron withdrawing groups and separator groups into the polymer molecular structure. The incorporation of bulky electron withdrawing groups in the diamine portion of the polymer structure serves to reduce the formation of interchain and intrachain charge transfer complexes which normally cause large absorptions in the UV visible range. Incorporation of separator atoms into either the diamine or dianhydride monomers serves to reduce the amount of conjugation and inter and intrachain electronic interactions to lessen charge transfer complex formation. NASA

N85-21361*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
METAL (11) 4,4',4',4''-PHTHALOCYANINE TETRAAMINES AS CURING AGENTS FOR EPOXY RESINS Patent Application
B. N. ACHAR (NAS-NRC, Washington, D.C.), G. M. FOHLEN, and J. A. PARKER, inventors (to NASA) 11 Apr. 1984 17 p
(NASA-CASE-ARC-11424-1; NAS 1.71:ARC-11424-1; US-PATENT-APPL-SN-598777) Avail: NTIS HC A02/MF A01 CSCL 11B

Metal, preferably divalent copper, cobalt or nickel, phthalocyanine tetraamines are used as curing agents for epoxides. The resulting copolymers have high thermal and chemical resistance and are homogeneous. They are useful as binders for laminates, e.g., graphite cloth laminate. NASA

N85-21362*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE RESISTANT POLYMERS BASED ON 1-(DIORGANO OXYPHOSPHONYL)METHYL-2,4- AND 2,6-DIAMINO BENZENES Patent Application
J. A. MIKROYANNIDIS (NAS-NRC, Washington, D.C.) and D. A. KOURTIDES, inventors (to NASA) 16 Aug. 1984 22 p
(NASA-CASE-ARC-11512-2; NAS 1.71:ARC-11512-2; US-PATENT-APPL-SN-641153) Avail: NTIS HC A02/MF A01 CSCL 11B

The 1-(diorgano oxyphosphonyl)methyl-2,4 and -2,6-diamino benzenes are reacted with polyacylhalides and optionally comonomers to produce polyamides which have desirable heat and fire resistance properties. These polymers are used to form fibers and fabrics where fire and flame resistance properties are important, like aircraft equipment and structures. NASA

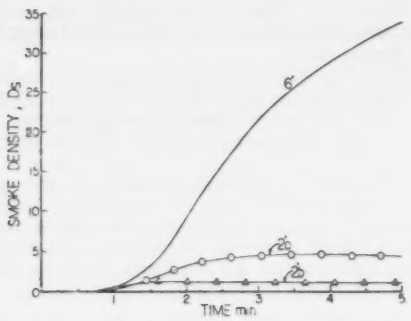
N85-21363*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE-RESISTANT PHOSPHORUS CONTAINING COMPOUNDS, POLYIMIDES AND COPOLYIMIDES Patent Application
J. A. MIKROYANNIDIS, inventor (to NASA) 16 Aug. 1984 24 p
(NASA-CASE-ARC-11522-2; NAS 1.71:ARC-11522-2; US-PATENT-APPL-SN-641143) Avail: NTIS HC A02/MF A01 CSCL 11B

Phosphorus containing polyimides and copolyimides are synthesized in a two step polycondensation reaction from 1-(diorgano oxyphosphonyl)methyl-2,4- and -2,6-diaminobenzenes and tetracarboxylic anhydride. The diorgano position of the diorganooxyphosphonyl group includes alkyl, such as ethyl, substituted alkyl, such as s 2-chioroethyl, and aryl such as phenyl. The tetracarboxylic anhydrides include compounds such as pyromellitic dianhydride and benzophenone tetracarboxylic dianhydride. The glass transition temperature of the polyimides is reduced by incorporation of the (dialkoxyphosphonyl)methyl groups. Both the molecular weight and the thermal stability of the polymers are reduced with increasing concentration of the phosphorus moieties. The phosphorus containing copolyimides show a considerably higher dgree of fire resistance as compared to that of the corresponding common polyimides, and can be used in matrix composites composites in very thermally stable high temperature graphite composites for aircraft applications. NASA

N85-21364*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FIRE AND HEAT RESISTANT LAMINATING RESINS BASED ON MALEIMIDO AND CITRACONIMIDO SUBSTITUTED 1-(DIORGANO OXYPHOSPHONYL)METHYL-2,4- AND 2,6-DIAMINOBENZENES Patent Application
J. A. MIKROYANNIDIS (NAS-NRC, Washington, D.C.) and D. A. KOURTIDES, inventors (to NASA) 16 Aug. 1984 30 p
(NASA-CASE-ARC-11533-1; NAS 1.71:ARC-11533-1;

US-PATENT-APPL-SN-641147) Avail: NTIS HC A03/MF A01 CSCL 11B

A novel class of fire and heat resistant bisimide resins prepared by thermal polymerization of maleimido or citraconimido substituted 1-(dialkox phosphonyl)methyl-2-4 and -2,6-diamino benzene was presented. The polymer precursors are prepared by reacting 1-(diorgano oxyphosphonyl)methyl-2-4- and -2,6-diamino benzenes with maleic anhydride or citraconic anhydride in a mole ratio 1:2. Chain extension of the monomers is achieved by reacting the mono-N-maleimido derivaties of 1-(diorgano oxyphosphonyl)methyl-2,4 and -2,6-diaminobenzenes with aryl tetracarboxylic dianhydrides, such as benzophenone tetracarboxylic dianhydride, or aryl diisocyanates, such as methylenebis (4-phenylisocyanate), in a mole ratio 2:1. The polymerization of the monomers is studies by differential scanning calorimetry (DSC) and the thermal stability of the polymers is ascertained by thermogravimetric analysis (TGA). NASA



Title: Smoke Density versus Time for Phosphorus Containing Polyimide Polymers and a Standard

31

ENGINEERING (GENERAL)

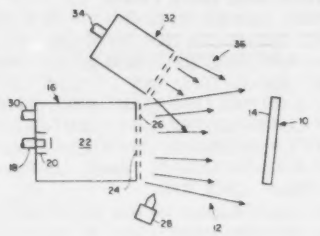
Includes vacuum technology; control engineering; display engineering; and cryogenics.

N85-20153* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DEPOSITION OF DIAMONDLIKE CARBON FILMS Patent

M. J. MIRTICH, J. S. SOVEY, and B. A. BANKS, inventors (to NASA) 25 Dec. 1984 6 p Filed 9 Jul. 1984 Supersedes N84-28986 (22 - 19, p 2996)
(NASA-CASE-LEW-14080-1; NAS 1.71:LEW-14080-1; US-PATENT-4,490,229; US-PATENT-APPL-SN-628866; US-PATENT-CLASS-204-192C; US-PATENT-CLASS-204-192R; US-PATENT-CLASS-204-192SP; US-PATENT-CLASS-423-414; US-PATENT-CLASS-423-445; US-PATENT-CLASS-423-446; US-PATENT-CLASS-423-449; US-PATENT-CLASS-423-DIG.10) Avail: US Patent and Trademark Office CSCL 13H

A diamondlike carbon film is deposited in the surface of a substrate by exposing the surface to an argon ion beam containing a hydrocarbon. The current density in the ion beam is low during initial deposition of the film. Subsequent to this initial low current condition, the ion beam is increased to full power. At the same time, a second argon ion beam is directed toward the surface of the substrate. The second ion beam has an energy level much greater than that of the ion beam containing the hydrocarbon. This addition of energy to the system increases mobility of the condensing atoms and serves to remove lesser bound atoms.
Official Gazette of the U.S. Patent and Trademark Office



N85-20154*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NEBULIZATION REFLUX CONCENTRATOR Patent Application

V. G. COLLINS (Coll. of William and Mary) and W. R. COFER, III, inventors (to NASA) 5 Nov. 1984 14 p
(NASA-CASE-LAR-13254-1; NAS 1.71:LAR-13254-1; US-PATENT-APPL-SN-668432) Avail: NTIS HC A02/MF A01 CSCL 13H

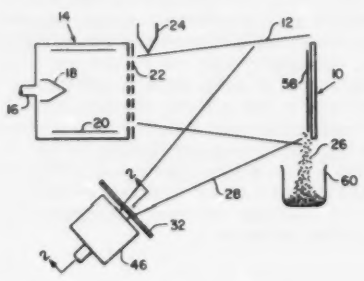
A nebulization reflux concentrator for removing trace gas contaminants from a sample gas is described. Sample gas from a gas supply is drawn by a suction source into a vessel. The gas enters vessel through an atomizing nozzle, thereby atomizing and entraining a scrubbing liquid solvent drawn through siphon tube from a scrubbing liquid reservoir. The gas and entrained liquid rise through concentrator and impinge upon a solvent-phobic filter, whereby purified gas exits through the filter housing and contaminated liquid coalesces on the solvent-phobic filter and falls into reservoir. NASA

N85-20155*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

APPARATUS FOR PRODUCING DIAMOND-LIKE CARBON FLAKES Patent Application

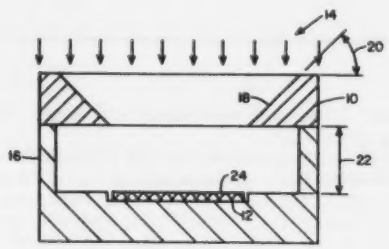
B. A. BANKS, inventor (to NASA) 5 Nov. 1984 12 p
(NASA-CASE-LEW-13837-3; NAS 1.71:LEW-13837-3; US-PATENT-APPL-SN-668433) Avail: NTIS HC A02/MF A01 CSCL 13H

A vacuum are from a spot at the face of a graphite cathode to a graphite anode produces a beam of carbon ions and atoms. A carbon coating from this beam is deposited on an ion beam sputtered target to produce diamondlike carbon flakes. A graphite tube encloses the cathode, and electrical isolation is provided by an insulating sleeve. The tube forces the vacuum arc spot to be confined to the surface on the outermost end of the cathode. Without the tube the arc spot will wander to the side of the cathode. This spot movement results in low rates of carbon deposition, and the properties of the deposited flakes are more graphite-like than diamond-like. NASA



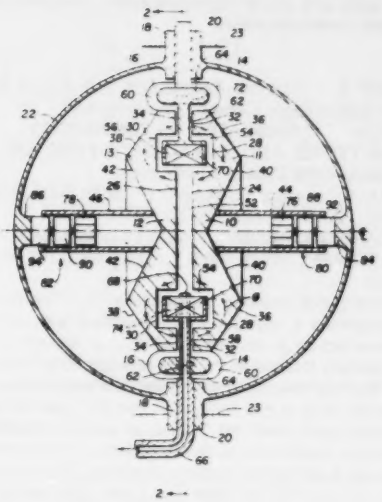
N85-20156*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEXTURED CARBON SURFACES ON COPPER Patent Application
A. N. CURREN, K. A. JENSEN, and R. F. ROMAN, inventors (to NASA) 10 Oct. 1984 12 p
(NASA-CASE-LEW-14130-1; NAS 1.71:LEW-14130-1; US-PATENT-APPL-SN-659475) Avail: NTIS HC A02/MF A01 CSCL 13H

A very thin layer of highly textured carbon is applied to a copper surface by a triode sputtering process. A carbon target and a copper substrate are simultaneously exposed to an argon plasma in a vacuum chamber. The resulting carbon surface is characterized by a dense, random array of needle like sprics or peaks which extend perpendicularly from the copper surface. The coated copper is especially useful for electrode plates in multistage depressed collectors. NASA



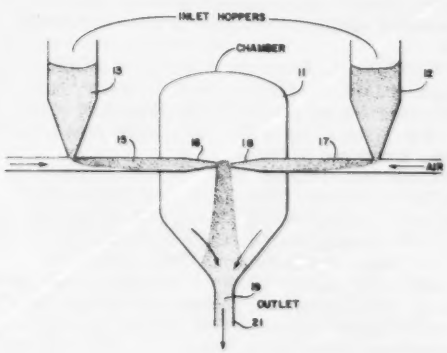
N85-21404* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGENTICALLY ACTUATED COMPRESSOR Patent
J. EVANS and P. A. STUDER, inventors (to NASA) 19 Feb. 1985 9 p Filed 28 Jan. 1983 Supersedes N83-20153 (21 - 10, p 1526)
(NASA-CASE-GSC-12799-1; NAS 1.71:GSC-12799-1; US-PATENT-4,500,265; US-PATENT-APPL-SN-461724; US-PATENT-CLASS-417-417; US-PATENT-CLASS-417-488; US-PATENT-CLASS-310-22; US-PATENT-CLASS-31-35; US-PATENT-CLASS-62-6; US-PATENT-CLASS-92-98R) Avail: US Patent and Trademark Office CSCL 13H

A vibration free fluid compressor particularly adapted for Stirling cycle cryogenic refrigeration apparatus comprises a pair of identical opposing ferromagnetic pistons located in a housing and between a gas spring including a sealed volume of a working fluid such as gas under pressure. The gas compresses and expands in accordance with movement of the pistons to generate a compression wave which can be vented to other apparatus, for example, a displacer unit in a Stirling cycle engine. The pistons are urged outwardly due to the pressure of the gas; however, a fixed electromagnetic coil assembly located in the housing adjacent the pistons, is periodically energized to produce a magnetic field which interlinks the pistons in such a fashion that the pistons are mutually attracted to one another. The mass of the pistons, in conjunction with the compressed gas between them, form a naturally resonant system which, when the pistons are electromagnetically energized, produces an oscillating compression wave in the entrapped fluid medium.
Official Gazette of the U.S. Patent and Trademark Office



N85-21407*# National Aeronautics and Space Administration. Pasadena Office, Calif.
IMPROVED SILICON GRINDING METHOD AND APPARATUS Patent Application
E. R. COLLINS, JR., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 29 Nov. 1984 9 p Sponsored by NASA
(NASA-CASE-NPO-16336-1-CU; NAS 1.71:NPO-16336-1-CU; US-PATENT-APPL-SN-676163) Avail: NTIS HC A02/MF A01 CSCL 13H

Opposing streams of silicon particles collide to form a collision product, which is repeatedly graded, refined by a series of jet mills and recycled to provide an output containing an improved yield of useful particles. NASA



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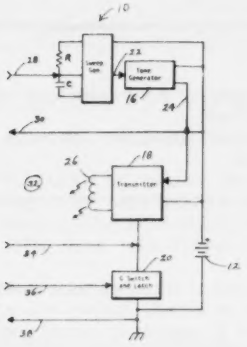
COMMUNICATIONS

Includes land and global communications; communications theory; and optical communications.

N85-20226*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMPROVED LEGISLATED EMERGENCY LOCATING TRANSMITTERS AND EMERGENCY POSITION INDICATING RADIO BEACONS Patent Application
W. R. WADE, inventor (to NASA) (Proteon Associates, Inc.) 28 Sep. 1984 23 p Sponsored by NASA
(NASA-CASE-GSC-12892-1; NAS 1.71:GSC-12892-1; US-PATENT-APPL-SN-655606) Avail: NTIS HC A02/MF A01 CSCL 17B

An emergency locating transmitting (ELT) system is disclosed which comprises a legislated ELT modified with an interface unit and connected by a multiwire cable to a remote control monitor (RCM), typically located at the pilot position. The RMC can remotely test the ELT by disabling the legislated swept tone and allowing transmission of a single tone, turn the ELT on for legislated ELT transmission, and reset the ELT to an armed condition. The RCM also provides visual and audio indications of transmitter operating condition as well as ELT battery condition. Removing the RCM or shorting or opening the interface input connections are not to affect traditional ELT operation. NASA



N85-21427* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
TELEVISION CAMERA VIDEO LEVEL CONTROL SYSTEM Patent
M. KRAVITZ (RCA, Princeton, N.J.), L. A. FREEDMAN (RCA, Princeton, N.J.), E. H. FREDD (RCA, Princeton, N.J.), and D. E. DENEF, inventors (to NASA) (RCA, Princeton, N.J.) 22 Jan. 1985 8 p Filed 9 Apr. 1982 Supersedes N82-27121 (20 - 17, p 2474) Sponsored by NASA
(NASA-CASE-MSC-18578-1; NAS 1.71:MSC-18578-1; US-PATENT-4,495,520; US-PATENT-APPL-SN-367132; US-PATENT-CLASS-358-219; US-PATENT-CLASS-358-217; US-PATENT-CLASS-358-174; US-PATENT-CLASS-358-161) Avail: US Patent and Trademark Office CSCL 17B

A video level control system is provided which generates a normalized video signal for a camera processing circuit. The video level control system includes a lens iris which provides a controlled light signal to a camera tube. The camera tube converts the light signal provided by the lens iris into electrical signals. A feedback circuit in response to the electrical signals generated by the camera tube, provides feedback signals to the lens iris and the camera tube. This assures that a normalized video signal is provided in a first illumination range. An automatic gain control loop, which is also responsive to the electrical signals generated by the camera tube 4, operates in tandem with the feedback circuit. This assures that the normalized video signal is maintained in a second illumination range.
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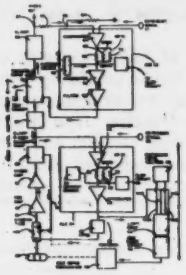

N85-21428* National Aeronautics and Space Administration. Pasadena Office, Calif.
MULTICOMPUTER COMMUNICATION SYSTEM Patent
A. K. AGRAWAL (JPL, California Inst. of Tech., Pasadena), P. G. MULLEN (JPL, California Inst. of Tech., Pasadena), and V. V. VADAKAN, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 8 Jan. 1985 17 p Filed 3 Apr. 1981 Supersedes N83-20634 (21 - 10, p 1596) Sponsored by NASA
(NASA-CASE-NPO-15433-1; NAS 1.71:NPO-15433-1; US-PATENT-4,493,021; US-PATENT-APPL-SN-250585; US-PATENT-CLASS-364-200) Avail: US Patent and Trademark Office CSCL 17B

A local area network is provided for a plurality of autonomous computers which operate at different rates and under different protocols coupled by network bus adapters to a global bus. A host computer (HC) divides a message file to be transmitted into blocks, each with a header that includes a data type identifier and a trailer. The associated network bus adapter (NBA) then divides the data into packets, each with a header to which a transport header and trailer is added with frame type code which specifies one of three modes of addressing in the transmission of data, namely a physical address mode for computer to computer transmission using two bytes for source and destination addresses, a logical address mode and a data type mode. In the logical address mode, one of the two addressing bytes contains a logical channel number (LCN) established between the transmitting and one or more receiving computers. In the data type mode, one of the addressing bytes contains a code identifying the type of data.
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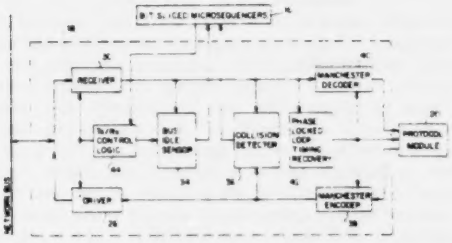
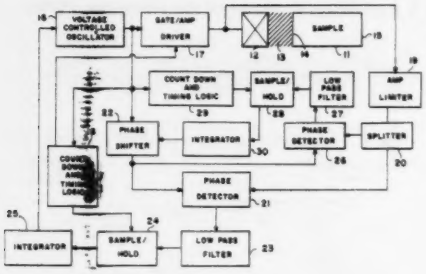


N85-21441*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
DOUBLE REFERENCE PULSED PHASE LOCKED LOOP (DRP-2L-2) Patent Application
J. S. HEYMAN, inventor (to NASA) 7 Mar. 1985 10 p
(NASA-CASE-LAR-13310-1; NAS 1.71:LAR-13310-1;
US-PATENT-APPL-SN-709257) Avail: NTIS HC A02/MF A01
CSCL 20N

A double reference pulse phase locked loop is described which measures the phase shift between tone burst signals initially derived from the same periodic signal source (voltage controlled oscillator) and delayed by different amounts because of two different paths. A first path is from the transducer to the surface of a sample and back, and a second path is from the transducer to the opposite surface and back. A first pulse phase locked loop including a phase detector and a phase shifter forces the tone burst signals delayed by the second path in phase quadrature with the periodic signal source. A second pulse phase locked loop including a second phase detector forces the tone burst signals delayed by the first path into phase quadrature with the phase shifted periodic signal source. NASA



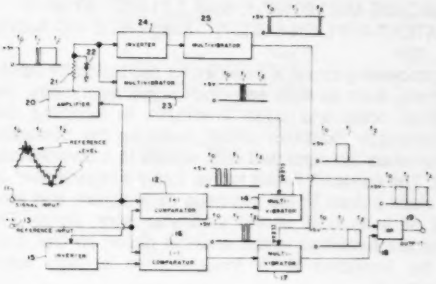
33

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

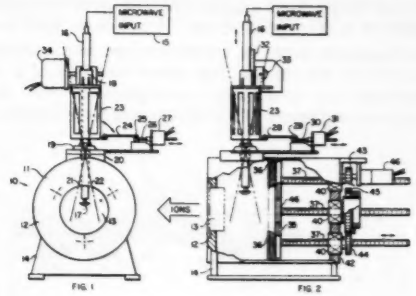
N85-20247*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPARATOR WITH NOISE SUPPRESSION Patent Application
C. N. BATTS, inventor (to NASA) 18 Dec. 1984 9 p
(NASA-CASE-LAR-13151-1; NAS 1.71:LAR-13151-1;
US-PATENT-APPL-SN-683101) Avail: NTIS HC A02/MF A01
CSCL 09A

An apparatus for generating a single pulse the first time only that a noisy cyclic signal exceeds a reference level during a half-cycle is disclosed. For the positive half of a cycle of the noisy cyclic signa, a comparator 12 and a multivibrator 14 produce a fixed voltage output when the noisy cyclic signal first exceeds the reference level. A multivibrator 23 stops the production of the fixed voltage output when the noisy cyclic signal next passes the zero voltage level in the negative direction. Consequently, a single pulse is generated indicating that the signal exceeded the reference level during that half-cycle. Comparator 16 and multi-vibrator 17 are for producing pulses whenever the noisy cyclic signal exceeds the reference level during the negative half-cycle. NASA



N85-20248*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PRECISION TUNABLE RESONANT MICROWAVE CAVITY Patent Application
S. NAKANISHI, F. S. CALCO, and A. R. SCARPELLI, inventors (to NASA) 11 Feb. 1985 9 p
(NASA-CASE-LEW-13935-1; NAS 1.71:LEW-13935-1;
US-PATENT-APPL-SN-700255) Avail: NTIS HC A02/MF A01
CSCL 09A

A tunable microwave cavity containing ionizable metallic vapor or gases and an apparatus for precisely positioning a microwave coupling tip in the cavity and for precisely adjusting at least one dimension of the cavity are disclosed. With this combined structure, resonance may be achieved with various types of ionizable gases. A coaxial probe extends into a microwave cavity through a tube. One end of the tube is retained in a spherical joint attached in the cavity wall. This allows the coaxial probe to be pivotally rotated. The coaxial probe is slideable within the tube thus allowing the probe to be extended toward or retracted from the center of the cavity. A tunable wall in the cavity is precisely positioned by a plurality of threated rods extending through threaded bushings which are geared together. Thus, rotation of one of the bushings caused rotation of the other bushings simultaneously whereby the tuning wall is accurately positioned. Means are provided for moving the tube through which the coaxial probe extends in both a side to side and back and forth motion. NASA



33 ELECTRONICS AND ELECTRICAL ENGINEERING

N85-20249*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PROCESSING CIRCUIT WITH ASYMMETRY CORRECTOR AND CONVOLUTIONAL ENCODER FOR DIGITAL DATA
H. J. PFIFFNER, inventor (to NASA) (Hughes Aircraft Co., Culver City, Calif.) 11 Sep. 1984 21 p Sponsored by NASA
(NASA-CASE-MSC-20187-1; NAS 1.71:MSC-20187-1;
US-PATENT-APPL-SN-649327) Avail: NTIS HC A02/MF A01
CSCL 09A

A processing circuit is provided for correcting for input parameter variations, such as data and clock signal asymmetry, phase offset and jitter, noise and signal amplitude, in incoming data signals. An asymmetry corrector circuit performs the correcting function and furnishes the corrected data signals to a convolutional encoder circuit. The corrector circuit further forms a regenerated clock signal from clock pulses in the incoming data signals and another clock signal at a multiple of the incoming clock signal. These clock signals are furnished to the encoder circuit so that encoded data may be furnished to a modulator at a high data rate for transmission. NASA

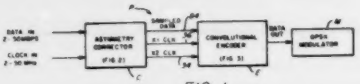


FIG. 1

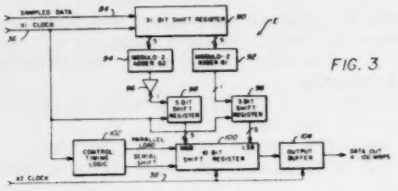
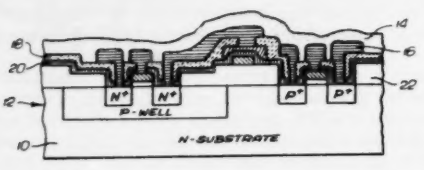


FIG. 3

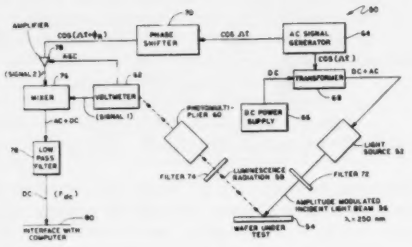
N85-20250*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD OF EXAMINING MICROCIRCUIT PATTERNS Patent Application
S. F. SUSZKO, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 13 Oct. 1983 19 p Sponsored by NASA
(NASA-CASE-NPO-16299-1; NAS 1.71:NPO-16299-1;
US-PATENT-APPL-SN-541526) Avail: NTIS HC A02/MF A01
CSCL 09C

Examination of microstructures of LSI and VLSI devices is facilitated by employing a method in which the device is photographed through a darkfield illumination optical microscope and the resulting negative subjected to inverse processing to form a positive on a photographic film. The film is then developed to form photographic prints or transparencies which clearly illustrate the structure of the device. The entire structure of a device may be examined by alternately photographing the device and selectively etching layers of the device in order to expose underlying layers. NASA



N85-20251*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD AND APPARATUS FOR MEASURING MINORITY CARRIER LIFETIME IN A DIRECT BAND-GAP SEMICONDUCTOR Patent Application
O. VONROOS, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 18 Dec. 1984 29 p
(Contract NAS7-918)
(NASA-CASE-NPO-163371-1; NAS 1.71:NPO-163371-1;
US-PATENT-APPL-SN-683111) Avail: NTIS HC A03/MF A01
CSCL 09C

A direct band-gap semiconductor is exposed to intensity-modulated photon radiation having a characteristic energy at least as great as the energy gap of the semiconductor. This produces a time dependent concentration of excess charge carriers through the material, producing a luminescence signal modulated at the same frequency as the incident radiation but shifted in phase by an amount related to the lifetime of minority carriers. In a preferred embodiment, the phase shift of the luminescence signal is determined by transforming it to a modulated electrical signal and mixing the electrical signal with a reference signal modulated at the same frequency and having a phase which is known relative to the incident radiation. Minority carrier lifetime is calculated by integrating a direct current component of the mixed signal (F sub dc) over a 2 pt range in phase of the reference signal. NASA



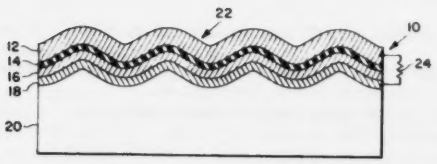
N85-21491* National Aeronautics and Space Administration. Pasadena Office, Calif.
HOLLOW CATHODE APPARATUS Patent
G. ASTON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 2 Oct. 1984 6 p Filed 22 Jun. 1981 Supersedes N84-16993 (22 - 07, p 1076) Sponsored by NASA
(NASA-CASE-NPO-15560-1; NAS 1.71:NPO-15560-1;
US-PATENT-4,475,063; US-PATENT-APPL-SN-275909;
US-PATENT-CLASS-315-111.81; US-PATENT-CLASS-315-111.31;
US-PATENT-CLASS-313-131A; US-PATENT-CLASS-250-426)
Avail: US Patent and Trademark Office CSCL 09A

A hollow cathode apparatus is described, which can be rapidly and reliably started. An ignitor positioned upstream from the hollow cathode, generates a puff of plasma that flows with the primary gas to be ionized through the cathode. The plasma puff creates a high voltage breakdown between the downstream end of the cathode and a keeper electrode, to heat the cathode to an electron-emitting temperature.

Official Gazette of the U.S. Patent and Trademark Office

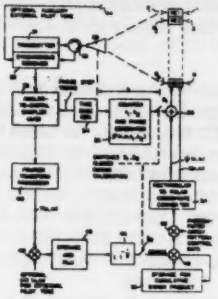
N85-21492* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INELASTIC TUNNEL DIODES Patent
L. M. ANDERSON, inventor (to NASA) 13 Nov. 1984 7 p Filed 19 Apr. 1983 Supersedes N83-25983 (21 - 15, p 2390)
(NASA-CASE-LEW-13833-1; NAS 1.71:LEW-13833-1; US-PATENT-4,482,779; US-PATENT-APPL-SN-486471; US-PATENT-CLASS-136-255; US-PATENT-CLASS-357-12; US-PATENT-CLASS-357-30) Avail: US Patent and Trademark Office CSCL 09A

Power is extracted from plasmons, photons, or other guided electromagnetic waves at infrared to midultraviolet frequencies by inelastic tunneling in metal-insulator-semiconductor-metal diodes. Inelastic tunneling produces power by absorbing plasmons to pump electrons to higher potential. Specifically, an electron from a semiconductor layer absorbs a plasmon and simultaneously tunnels across an insulator into metal layer which is at higher potential. The diode voltage determines the fraction of energy extracted from the plasmons; any excess is lost to heat.
Official Gazette of the U.S. Patent and Trademark Office



N85-21493* National Aeronautics and Space Administration. Pasadena Office, Calif
METHOD AND APPARATUS FOR SELF-CALIBRATION AND PHASING OF ARRAY ANTENNA Patent
C. WU, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 11 Dec. 1984 11 p Filed 30 Jul. 1982 Supersedes N82-33593 (21 - 24, p 3423)
(NASA-CASE-NPO-15920-1; NAS 1.71:NPO-15920-1; US-PATENT-4,488,155; US-PATENT-APPL-SN-403848; US-PATENT-CLASS-343-376; US-PATENT-CLASS-343-17.7) Avail: US Patent and Trademark Office CSCL 09C

A technique for self-calibrating and phasing a lens-feed array antenna, while normal operation is stopped, utilizes reflected energy of a continuous and coherent wave broadcast by a transmitter through a central feed while a phase controller advances the phase angles of reciprocal phase shifters in radiation electronics of the array elements at different rates to provide a distinct frequency modulation of electromagnetic wave energy returned by reflection in one mode and leakage in another mode from the radiation electronics of each array element. The composite return signal received by a synchronous receiver goes through a Fourier transform processing system and produces a response function for each antenna element. Compensation of the phase angles for the antenna elements required to conform the antenna response to a precomputed array pattern is derived from the reciprocal square root of the response functions for the antenna elements which, for a rectangular array of NXM elements, is a response function T(n,m). A third mode of calibration uses an external pilot tone from a separate antenna element. Respective responses are thus obtained from the three modes of calibration.
Official Gazette of the U.S. Patent and Trademark Office



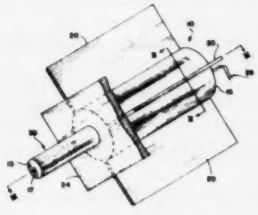
34

FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N85-21568* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HEAT PIPE COOLED PROBE Patent
C. J. CAMARDA, inventor (to NASA) and L. M. COUCH 4 Dec. 1984 6 p Filed 13 Feb. 1981 Supersedes N81-24525 (19 - 15, p 2075)
(NASA-CASE-LAR-12588-1; NAS 1.71:LAR-12588-1; US-PATENT-4,485,670; US-PATENT-APPL-SN-234222; US-PATENT-CLASS-73-179; US-PATENT-CLASS-73-708; US-PATENT-CLASS-165-104.26) Avail: US Patent and Trademark Office CSCL 20D

The basic heat pipe principle is employed to provide a self-contained passively cooled probe that may be placed into a high temperature environment. The probe consists of an evaporator region of a heat pipe and a sensing instrument. Heat is absorbed as the working fluid evaporates in the probe. The vapor is transported to the vapor space of the condenser region. Heat is dissipated from the condenser region and fins causing condensation of the working fluid, which returns to the probe by gravity and the capillary action of the wick. Working fluid, wick and condenser configurations and structure materials can be selected to maintain the probe within an acceptable temperature range. Official Gazette of the U.S. Patent and Trademark Office



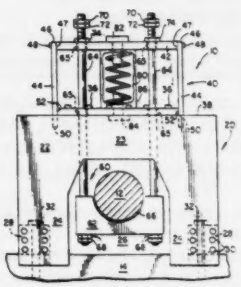
35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

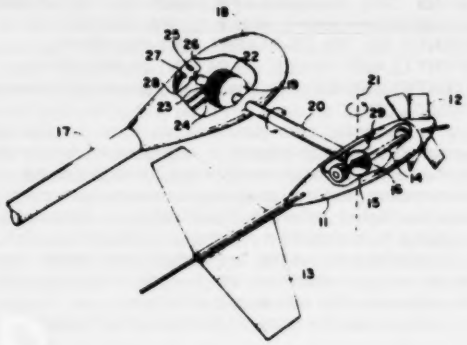
N85-20294* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PORTABLE PALLET WEIGHING APPARATUS Patent
R. M. DAY, inventor (to NASA) 30 Oct. 1984 6 p Filed 19 Aug. 1982 . Supersedes N83-13425 (21 - 04, p 0521)
(NASA-CASE-GSC-12789-1; NAS 1.71:GSC-12789-1; US-PATENT-4,479,560; US-PATENT-APPL-SN-409680; US-PATENT-CLASS-177-147; US-PATENT-CLASS-177-260; US-PATENT-CLASS-73-862.54) Avail: US Patent and Trademark Office CSCL 14B

An assembly for use with several like units in weighing the mass of a loaded cargo pallet supported by its trunnions has a bridge frame for positioning the assembly on a transportation frame carrying the pallet while straddling one trunnion of the pallet and its trunnion lock, and a cradle assembly for incrementally raising the trunnion. The mass at the trunnion is carried as a static load by a slidable bracket mounted upon the bridge frame for supporting the cradle assembly. The bracket applies the static loading to an electrical load cell symmetrically positioned between the bridge frame and the bracket. The static loading compresses the load cell, causing a slight deformation and a potential difference at load cell terminals which is proportional in amplitude to the mass of the pallet at the trunnion. R.J.F.



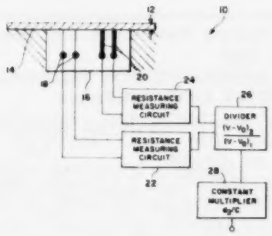
N85-20295* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MINIATURE ELECTROOPTICAL AIR FLOW SENSOR Patent
D. D. KERSHNER, inventor (to NASA) 4 Dec. 1984 10 p Filed 14 Apr. 1983 Supersedes N83-25539 (21 - 14, p 2320)
(NASA-CASE-LAR-13065-1; NAS 1.71:LAR-13065-1; US-PATENT-4,485,671; US-PATENT-APPL-SN-484745; US-PATENT-CLASS-73-187) Avail: US Patent and Trademark Office CSCL 14B

A sensor for measuring flow direction and airspeed that is suitable, because of its small size, for rapid instrumentation of research airplanes is described. A propeller driven sphere rotating at a speed proportional to airspeed presents a reflective target to an electro-optical system such that the duty cycle of the resulting electrical output is proportional to yaw angle and the frequency is proportional to airspeed. R.J.F.



N85-20297*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
LIQUID THICKNESS GAGE Patent Application
L. M. WEINSTEIN, inventor (to NASA) 20 Dec. 1984 11 p
(NASA-CASE-LAR-13342-1; NAS 1.71:LAR-13342-1; US-PATENT-APPL-SN-684186) Avail: NTIS HC A02/MF A01 CSCL 14B

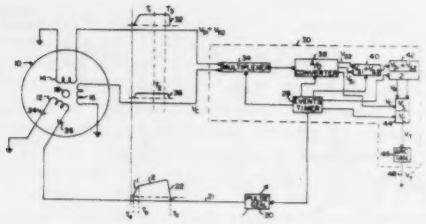
A method and apparatus to measure the thickness of liquid independent of liquid conductivity are disclosed. Two pairs of round, corrosion resistant wire are mounted in an insulating material such that the cross-sectional area of each wire is flush with and normal to the surface. The resistance between each pair of wires are measured using two AC resistance measuring circuits. The ratio of the outputs of the two resistance measuring circuits is indicative of the thickness of the liquid on the surface. NASA



N85-20298*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ANGULAR MEASUREMENT SYSTEM Patent Application
J. R. CURRIE and R. KISSEL, inventors (to NASA) 3 Oct. 1984 13 p
(NASA-CASE-MFS-25825-1; NAS 1.71:MFS-25825-1; US-PATENT-APPL-SN-657309) Avail: NTIS HC A02/MF A01 CSCL 14B

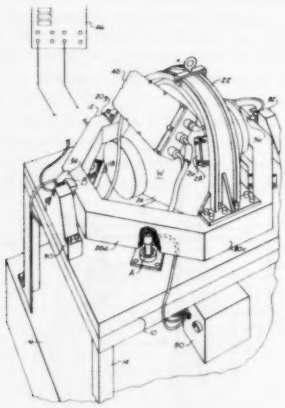
A system for the measurement of shaft angles is disclosed wherein a synchro resolver is sequentially pulsed, and alternately, a sine and then a cosine representive voltage output of it are sampled. Two like type, sine or cosine, succeeding outputs (V

sub S1, V sub S2) are averaged and algebraically related to the opposite type output pulse (V sub c) occurring between the averaged pulses to provide a precise indication of the angle of a shaft coupled to the resolver at the instant of the occurrence of the intermediately occurring pulse (V sub c). NASA



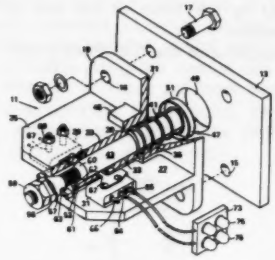
N85-20299*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EMITTED VIBRATION MEASUREMENT DEVICE AND METHOD Patent Application
G. L. GISLER, inventor (to NASA) (Sperry Corp., Phoenix, Ariz.) 3 Oct. 1984 17 p
(NASA-CASE-MFS-25981-1; NAS 1.71:MFS-25981-1; US-PATENT-APPL-SN-657310) Avail: NTIS HC A02/MF A01 CSCL 14B

This invention is directed to a method and apparatus for measuring emitted vibrational forces produced by a reaction wheel assembly due to imbalances, misalignment, bearing defects and the like. The apparatus includes a low mass carriage supported on a large mass base. The carriage is in the form of an octangonal frame having an opening which is adapted for receiving the reaction wheel assembly supported thereon by means of a mounting ring. The carriage is supported on the base by means of air bearings which support the carriage in a generally frictionless manner when supplied with compressed air from source. A plurality of carriage brackets and a plurality of base blocks provide for physical coupling of the base and carriage. The sensing axes of the load cells are arranged generally parallel to the base and connected between the base and carriage. NASA



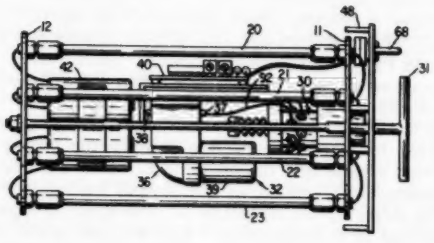
N85-20300*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ADJUSTABLE INDICATING DEVICE FOR LOAD POSITION Patent Application
C. HELLER, inventor (to NASA) 20 Dec. 1984 10 p
(NASA-CASE-MFS-28008-1; NAS 1.71:MFS-28008-1; US-PATENT-APPL-SN-684194) Avail: NTIS HC A02/MF A01 CSCL 14B

An indicating device designed to provide an electrical signal relative to the position of a load is described. The device has a central housing with two wing structures on each side which support conventional switch means having cantilevered arms. Extending through the housing is a movable shaft that is spring biased to a forward extended position and adapted to respond against a load being positioned. The rear end of the movable shaft has an adjustable cam means which acts upon the cantilevered arms to cause a switching action upon shifting of the movable shaft by a load. NASA



N85-20301*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SOLID SORBENT AIR SAMPLER Patent Application
T. J. GALEN, inventor (to NASA) (Northrop Services, Inc., Los Angeles) 10 Oct. 1984 19 p
(NASA-CASE-MSC-20653-1; NAS 1.71:MSC-20653-1; US-PATENT-APPL-SN-659474) Avail: NTIS HC A02/MF A01 CSCL 14B

A fluid sampler for collecting a plurality of discreet samples over separate time intervals is presented. The sampler comprises a sample assembly with an inlet and a plurality of discreet sample tubes each of which has inlet and outlet sides. A multiport dual acting valve is provided in the sampler to sequentially pass air from the sample inlet into the selected sample tubes. The sample tubes extend longitudinally from the housing and are located at its outer periphery so that upon removal of an enclosure cover, they are readily accessible for analytical operation of the sampler. NASA



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35 INSTRUMENTATION AND PHOTOGRAPHY

N85-21595* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SELF-CHARGING METERING AND DISPENSING DEVICE FOR FLUIDS Patent

S. L. HOOPER (Pan American World Airways, Inc., Houston, Tex.) and D. SETZER, inventors (to NASA) (Pan American World Airways, Inc., Houston, Tex.) 18 Dec. 1984 7 p Filed 28 Sep. 1982 Supersedes N83-17856 (21 - 08, p 1184:I) Sponsored by NASA (NASA-CASE-MSC-20275-1; NAS 1.71:MSC-20275-1; US-PATENT-4,488,663; US-PATENT-APPL-SN-425205; US-PATENT-CLASS-222-43; US-PATENT-CLASS-222-48; US-PATENT-CLASS-222-309; US-PATENT-CLASS-222-340)
Avail: US Patent and Trademark Office CSCL 14B

A self-metering and dispensing device for fluids obtained from a pressurized fluid supply is discussed. Tubing and valving means permit the introduction of fluid into and discharge from a closed cylindrical reservoir. The reservoir contains a slideably disposed piston co-acting with a coil compression spring, with piston travel determining the amount of fluid in the reservoir. Once the determined amount of fluid is introduced into the reservoir, the fluid is discharged by the force of the coil compression spring acting upon the piston.

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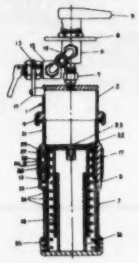

N85-21596* National Aeronautics and Space Administration. Pasadena Office, Calif.

STATE-OF-CHARGE COULOMETER Patent

J. J. ROWLETTE, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 12 Feb. 1985 15 p Filed 9 Apr. 1982 Supersedes N82-26630 (20 - 17, p 2404) Sponsored by NASA (NASA-CASE-NPO-15759-1; NAS 1.71:NPO-15759-1; US-PATENT-4,499,424; US-PATENT-APPL-SN-367136; US-PATENT-CLASS-324-427; US-PATENT-CLASS-429-58)
Avail: US Patent and Trademark Office CSCL 14B

A coulometer for accurately measuring the state-of-charge of an open-cell battery utilizing an aqueous electrolyte, includes a current meter for measuring the battery/discharge current and a flow meter for measuring the rate at which the battery produces gas during charge and discharge. Coupled to the flow meter is gas analyzer which measures the oxygen fraction of the battery gas. The outputs of the current meter, flow meter, and gas analyzer are coupled to a programmed microcomputer which includes a CPU and program and data memories. The microcomputer calculates that fraction of charge and discharge current consumed in the generation of gas so that the actual state-of-charge can be determined. The state-of-charge is then shown on a visual display.

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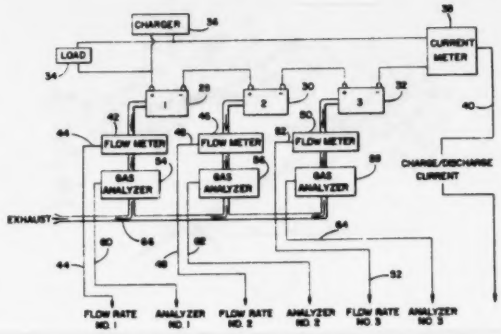


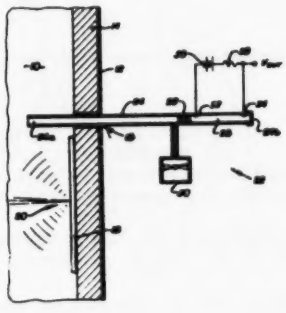
N85-21597* National Aeronautics and Space Administration. Pasadena Office, Calif.

CARBON GRANULE PROBE MICROPHONE FOR LEAK DETECTION Patent

S. P. PARTHASARATHY, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 12 Feb. 1985 5 p Filed 1 Jun. 1983 Supersedes N83-29595 (21 - 18, p 2929) Sponsored by NASA (NASA-CASE-NPO-16027-1; NAS 1.71:NPO-16027-1; US-PATENT-4,498,333; US-PATENT-APPL-SN-500044; US-PATENT-CLASS-73-40.5A; US-PATENT-CLASS-73-753)
Avail: US Patent and Trademark Office CSCL 14B

A microphone which is not subject to corrosion is provided by employing carbon granules to sense sound waves. The granules are packed into a ceramic tube and no diaphragm is used. A pair of electrodes is located in the tube adjacent the carbon granules and are coupled to a sensing circuit. Sound waves cause pressure changes on the carbon granules which results in a change in resistance in the electrical path between the electrodes. This change in resistance is detected by the sensing circuit. The microphone is suitable for use as a leak detection probe in recovery boilers, where it provides reliable operation without corrosion problems associated with conventional microphones.

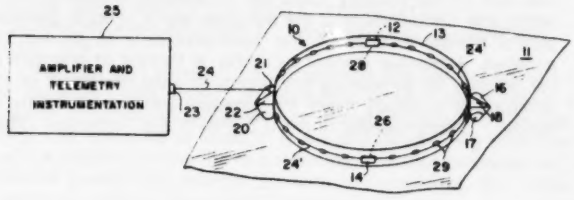
Official Gazette of the U.S. Patent and Trademark Office



N85-21598* National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.
THIN FILM STRAIN TRANSDUCER Patent
J. L. RAND, inventor (to NASA) (Southwest Research Inst., San Antonio) 12 Feb. 1985 7 p Filed 26 Aug. 1983 Supersedes N84-12448 (22 - 03, p 0376) Division of US Patent No. 4,425,808, US Patent Appl. SN-352827, filed 26 Feb. 1982 Sponsored by NASA
(NASA-CASE-WLP-10055-2; NAS 1.71:WLP-10055-2; US-PATENT-4,498,231; US-PATENT-4,425,808; US-PATENT-APPL-SN-526770; US-PATENT-APPL-SN-352827; US-PATENT-CLASS-29-610SG) Avail: US Patent and Trademark Office CSCL 14B

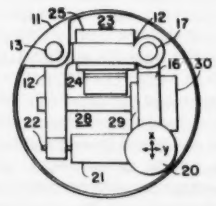
A strain transducer system and process for making same is disclosed wherein a beryllium-copper ring having four strain gages disposed thereon is electrically connected in Wheatstone bridge fashion to output instrumentation. Tabs are bonded to a balloon or like surface with strain on the surface causing bending of the ring and providing an electrical signal through the gages proportional to the surface strain. A figure is provided which illustrates a pattern of a one-half ring segment as placed on a sheet of beryllium-copper for chem-mill etch formation, prior to bending and welding of a pair of the segments to form a ring structure.

Official Gazette of the U.S. Patent and Trademark Office



N85-21610*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A TWO-AXIS, SELF-NULLING SKIN FRICTION BALANCE Patent Application
P. TCHENG, inventors (to NASA) and F. H. SUPPLEE, JR. 28 Feb. 1985 9 p
(NASA-CASE-LAR-13294-1; NAS 1.71:LAR-13294-1; US-PATENT-APPL-SN-706681) Avail: NTIS HC A02/MF A01 CSCL 14B

A skin friction force measuring device is described which is comprised of a first pivoted L shaped arm, a second arm pivoted on one end of the L shaped arm with a sensing element attached to an end of the second arm. In response to skin friction forces on the sensing element the arms are pivoted about the two pivots and two nulling means force the pivots back to their zero position. The outputs of the two nulling means are indicative of the skin friction forces along two perpendicular axes in the plane of the sensing element. NASA



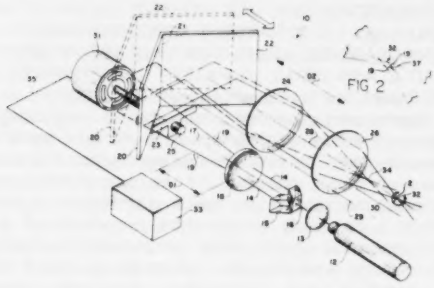
36

LASERS AND MASERS

Includes parametric amplifiers.

N85-20320*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PROJECTION LENS SCANNING LASER VELOCIMETER SYSTEM Patent Application
W. D. GUNTER, JR. and A. DEYOUNG, inventors (to NASA) 18 Jan. 1985 13 p
(NASA-CASE-ARC-11547-1; NAS 1.71:ARC-11547-1; US-PATENT-APPL-SN-692745) Avail: NTIS HC A02/MF A01 CSCL 20E

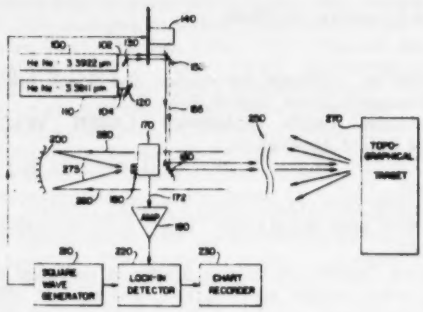
A laser Doppler velocimeter system is disclosed that has a laser, a waist position adjusting lens, and a beam splitter which direct laser beams parallel to the optical axis of the negative lens. The negative lens is fixed relative to an afocal lens pair. A pair planar mirrors intersect at right angles and respectively intersect the optical axis and the optical axis of the afocal lens pair. Mirrors are movable along the optical axis toward and away from the afocal lens pair to focus the laser beams in focus area while maintaining a constant beam waist, crossing angle, and intersection with other laser beams. This produces a constant sensitive volume as the focus is changed. NASA



N85-21631* National Aeronautics and Space Administration. Pasadena Office, Calif.
PORTABLE REMOTE LASER SENSOR FOR METHANE LEAK DETECTION Patent
W. B. GRANT (JPL, California Inst. of Tech., Pasadena) and E. D. HINKLEY, JR., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 18 Dec. 1984 13 p Filed 24 Sep. 1982 Supersedes N83-33137 (21 - 21, p 3471) Sponsored by NASA
(NASA-CASE-NPO-15790-1; NAS 1.71:NPO-15790-1; US-PATENT-4,489,239; US-PATENT-APPL-SN-423016; US-PATENT-CLASS-250-339; US-PATENT-CLASS-250-343) Avail: US Patent and Trademark Office CSCL 20E

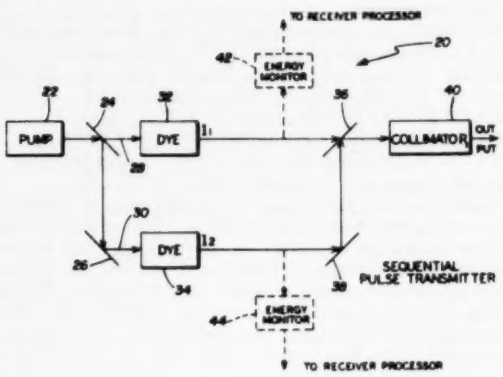
A portable laser system for remote detection of methane gas leaks and concentrations is disclosed. The system transmitter includes first and second lasers, tuned respectively to a wavelength coincident with a strong absorption line of methane and a reference wavelength which is weakly absorbed by methane gas. The system receiver includes a spherical mirror for collecting the reflected laser radiation and focusing the collected radiation through a narrowband optical filter onto an optial detector. The filter is tuned to the wavelength of the two lasers, and rejects background noise. The output of the optical detector is processed by a lock-in detector

synchronized to the chopper, and which measures the difference between the first wavelength signal and the reference wavelength signal. R.J.F.



N85-21639* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD OF AND APPARATUS FOR MEASURING TEMPERATURE AND PRESSURE Patent
C. L. KORB and J. E. KALSHOVEN, JR., inventors (to NASA) 15 Jan. 1985 17 p Filed 28 May 1982 Supersedes N82-29580 (20 - 20, p 2829)
(NASA-CASE-GSC-12558-1; NAS 1.71:GSC-12558-1; US-PATENT-4,493,553; US-PATENT-APPL-SN-383086; US-PATENT-CLASS-356-43; US-PATENT-CLASS-73-705; US-PATENT-CLASS-356-45; US-PATENT-CLASS-374-137)
Avail: US Patent and Trademark Office CSCL 20E

Laser beams are transmitted through gas to a reflecting target, which may be either a solid surface or particulate matter in gas or the gas molecules. The return beams are measured to determine the amount of energy absorbed by the gas. For temperature measurements, the laser beam has a wavelength at which the gas exhibits a relatively temperature sensitive and pressure insensitive absorption characteristic for pressure measurements, the laser beam has a wavelength at which the gas has a relatively pressure sensitive and temperature insensitive absorption characteristic. To reduce the effects of scattering on the absorption measurements a reference laser beam with a weak absorption characteristic is transmitted colinearly with the data beam having a strong absorption characteristic. The two signals are processed as a ratio to eliminate back scattering. Embodiments of transmitters and receivers described include a sequential laser pulse transmitter and receiver, a simultaneous laser pulse transmitter and receiver.
Official Gazette of the U.S. Patent and Trademark Office



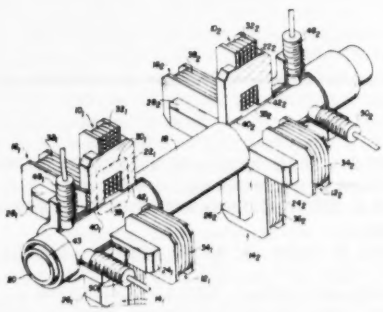
37

MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N85-20337* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LINEAR MAGNETIC BEARINGS Patent
M. P. GOLDOWSKIY (North American Philips Co., Inc., Briarcliff Manor, N.Y.) 25 Sep. 1984 12 p Filed 8 Sep. 1982 Supersedes N83-13460 (21 - 04, p 0526) Continuation-in-part of abandoned US Patent Appl. SN-220213, filed 24 Dec. 1980 Sponsored by NASA
(NASA-CASE-GSC-12582-2; NAS 1.71:GSC-12582-2; US-PATENT-4,473,259; US-PATENT-APPL-SN-415960; US-PATENT-APPL-SN-220213; US-PATENT-CLASS-308-10; US-PATENT-CLASS-104-281; US-PATENT-CLASS-104-284)
Avail: US Patent and Trademark Office CSCL 13I

A self regulating, nonfrictional, active magnetic bearing is disclosed which has an elongated cylindrical housing for containing a shaft type armature with quadrature positioned shaft position sensors and equidistantly positioned electromagnets located at one end of the housing. Each set of sensors is responsive to orthogonal displacement of the armature and is used to generate control signals to energize the electromagnets to center the armature. A bumper magnet assembly is located at one end of the housing for dampening any undesired axial movement of the armature or to axially move the armature either continuously or fixedly. Official Gazette of the U.S. Patent and Trademark Office

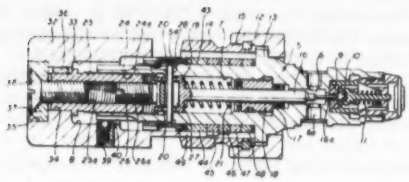


N85-20338* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SLOW OPENING VALVE Patent
D. F. DRAPEAU, inventor (to NASA) (Hamilton Standard, Windsor Locks, Conn.) 20 Nov. 1984 6 p Filed 25 Jun. 1982 Supersedes N82-28641 (20 - 19, p 2693) Sponsored by NASA
(NASA-CASE-MSC-20112-1; NAS 1.71:MSC-20112-1; US-PATENT-4,483,512; US-PATENT-APPL-SN-392104; US-PATENT-CLASS-251-265; US-PATENT-CLASS-251-267; US-PATENT-CLASS-251-284; US-PATENT-CLASS-251-297; US-PATENT-CLASS-74-424.8B; US-PATENT-CLASS-74-424.8VA)
Avail: US Patent and Trademark Office CSCL 13K

A valve control is described having a valve body with an actuator stem and a rotating handle connected to the actuator stem by a differential drive mechanism which, during uniform movement of the handle in one direction, initially opens the valve at a relatively slow rate and, thereafter, complete the valve movement at a substantially faster rate. A series of stop rings are received about

the body in frictional abutting relationship and serially rotated by the handle to uniformly resist handle movement independently of the extent of handle movement.

Official Gazette of the U.S. Patent and Trademark Office



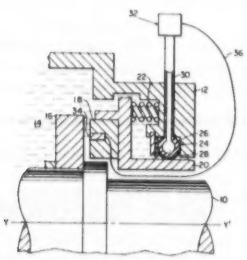
N85-20377*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

VARIABLE FRICTION SECONDARY SEAL FOR FACE SEALS Patent Application

E. DIRUSSO, inventor (to NASA) 16 Nov. 1984 8 p

(NASA-CASE-LEW-14170-1; NAS 1.71:LEW-14170-1; US-PATENT-APPL-SN-672224) Avail: NTIS HC A02/MF A01 CSCL 11A

Vibration and stability of a primary seal ring are controlled by a secondary seal system. An inflatable bladder which forms a portion of secondary seal varies the damping applied to this seal ring. The amplitude of vibration of the primary seal ring is sensed with a proximity probe that is connected to a microprocessor in a control system. The bladder pressure is changed by the control system to mitigate any sensed instability or vibration. NASA



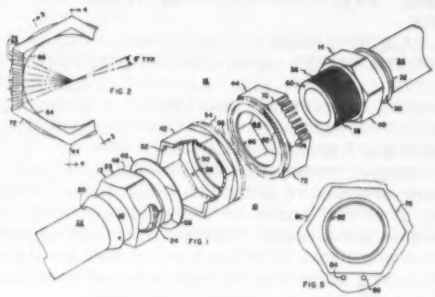
N85-20378*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

TUBE COUPLING DEVICE Patent Application

W. N. MEYERS and L. A. HEIN, inventors (to NASA) 18 Jan. 1985 12 p

(NASA-CASE-MFS-25964-1; NAS 1.71:MFS-25964-1; US-PATENT-APPL-SN-692801) Avail: NTIS HC A02/MF A01 CSCL 13K

A first annular ring has a keyed opening sized to fit around the nut region of a male coupling and a second annular ring has a keyed opening sized to fit around the nut of a female coupling. Each ring has mating ratchet teeth and these rings are biased together, thereby engaging these teeth and preventing rotation of these rings. This in turn prevents the rotation of the male nut region with respect to the female nut. For tube-to-bulkhead locking, one facet of one ring is notched, and a pin is pressed into an opening in the bulkhead. This pin is sized to fit within one of the notches in the ring thereby preventing rotation of this ring with respect to the bulkhead. NASA



N85-21649* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

CONNECTION SYSTEM Patent

B. MCCANDLESS, II, inventor (to NASA) 20 Nov. 1984 9 p Filed 30 Jun. 1982 Supersedes N82-31689 (20 - 22, p 3137)

(NASA-CASE-MSC-20319-1; NAS 1.71:MSC-20319-1; US-PATENT-4,483,639; US-PATENT-APPL-SN-393582; US-PATENT-CLASS-403-317; US-PATENT-CLASS-292-252; US-PATENT-CLASS-81-177G) Avail: US Patent and Trademark Office CSCL 13I

A mechanical connection system comprises a first body defining a receptable and a second body defining a pin matingly receivable in the receptacle by relative movement in a first directional mode. A primary latch is engagable between the two bodies to retain the pin in the receptacle. The primary latch is reciprocable in a second directional mode transverse to the first directional mode. A lock member carried by one of the bodies is operatively associated with the primary latch and movable, transverse to the second directional mode, between a locking position maintaining engagement of the primary latch and a releasing position permitting release of the primary latch. The lock includes an operator portion engagable to move the lock member from its locking position to its releasing position. The operator is located internally of the first body. An actuator is selectivity insertable into and disengagable from the first body. The actuator is movable relative to the first body when it is inserted for engagement with and operation of the operator.

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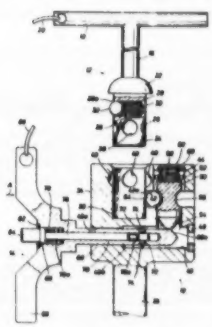

N85-21650* National Aeronautics and Space Administration. Pasadena Office, Calif.

INGOT SLICING MACHINE AND METHOD Patent

Y. S. KUO, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 9 Oct. 1984 13 p Filed 11 Jun. 1982 Sponsored by NASA

(NASA-CASE-NPO-15483-1; NAS 1.71:NPO-15483-1; US-PATENT-4,475,527; US-PATENT-APPL-SN-387648; US-PATENT-CLASS-125-13R; US-PATENT-CLASS-82-90; US-PATENT-CLASS-83-664; US-PATENT-CLASS-83-676; US-PATENT-CLASS-125-15; US-PATENT-CLASS-51-73R) Avail: US Patent and Trademark Office CSCL 13H

An improved method for simultaneously slicing one or a multiplicity of boules of silicon into silicon wafers is described. A plurality of vertical stacks of horizontal saw blades of circular configuration are arranged in juxtaposed coaxial alignment. Each blade is characterized by having a cutting diameter slightly greater than the cutting diameter of the blade arranged immediately above, imparting a simultaneous rotation to the blades.

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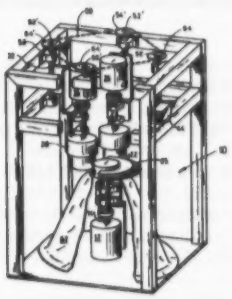


N85-21651* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

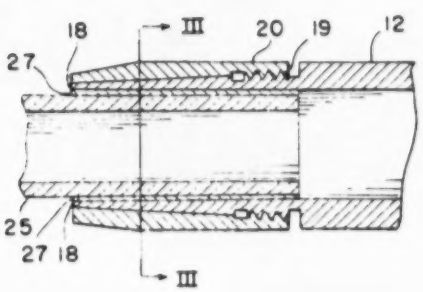
REUSABLE THERMAL CYCLING CLAMP Patent

W. J. DEBNAM, JR., A. L. FRIPP, and R. K. CROUCH, inventors (to NASA) 1 Jan. 1985 6 p Filed 17 Nov. 1981 Supersedes N82-18390 (20 - 09, p 1208)

(NASA-CASE-LAR-12868-1; NAS 1.71:LAR-12868-1; US-PATENT-4,491,427; US-PATENT-APPL-SN-322321; US-PATENT-CLASS-374-208; US-PATENT-CLASS-374-210)

Avail: US Patent and Trademark Office CSCL 13I

A reusable metal clamp for retaining a fused quartz ampoule during temperature cycling in the range of 20 deg C to 1000 deg C is described. A compressible graphite foil having a high radial coefficient of thermal expansion is interposed between the fused quartz ampoule and metal clamp to maintain a snug fit between these components at all temperature levels in the cycle. R.J.F.



N85-21652* National Aeronautics and Space Administration. Pasadena Office, Calif.

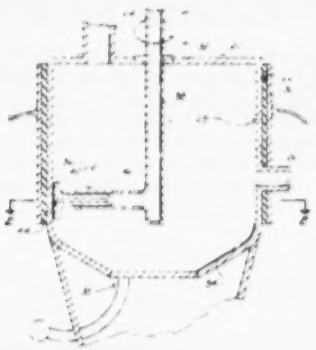
APPARATUS AND METHOD TO KEEP THE WALLS OF A FREE-SPACE REACTOR FREE FROM DEPOSITS OF SOLID MATERIALS Patent

K. A. YAMAKAWA, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 19 Feb. 1985 10 p Filed 8 Sep. 1982 Supersedes N83-12986 (21 - 03, p 0455) Sponsored by NASA

(NASA-CASE-NPO-15851-1; NAS 1.71:NPO-15851-1; US-PATENT-4,500,492; US-PATENT-APPL-SN-415879; US-PATENT-CLASS-422-199; US-PATENT-CLASS-15-406; US-PATENT-CLASS-134-37; US-PATENT-CLASS-422-129)

Avail: US Patent and Trademark Office CSCL 13I

An apparatus and method is disclosed for keeping interior walls of a reaction vessel free of undesirable deposits of solid materials in gas-to-solid reactions. The apparatus includes a movable cleaning head which is configured to be substantially complementary to the interior contour of the walls of the reaction vessel. The head ejects a stream of gas with a relatively high velocity into a narrow space between the head and the walls. The head is moved substantially continuously to at least intermittently blow the stream of gas to substantially the entire surface of the walls wherein undesirable solid deposition is likely to occur. The disclosed apparatus and process is particularly useful for keeping the walls of a free-space silane-gas-to-solid-silicon reactor free of undesirable silicon deposits. R.J.F.



43

EARTH RESOURCES

Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

N85-21723* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF MEASURING SEA SURFACE WATER TEMPERATURE WITH A SATELLITE INCLUDING WIDEBAND PASSIVE SYNTHETIC-APERTURE MULTICHANNEL RECEIVER Patent

J. M. STACEY, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 12 Feb. 1985 11 p Filed 6 May 1982 Supersedes N82-26523 (20 - 17, p 2390) Sponsored by NASA

(NASA-CASE-NPO-15651-1; NAS 1.71:NPO-15651-1; US-PATENT-4,499,470; US-PATENT-APPL-SN-375620; US-PATENT-CLASS-343-352; US-PATENT-CLASS-374-122)

Avail: US Patent and Trademark Office CSCL 14B

A wideband passive synthetic-aperture multichannel receiver with an antenna is mounted on a satellite which travels in an orbit above the Earth passing over large bodies of water, e.g., the Atlantic Ocean. The antenna is scanned to receive signals over a wide frequency band from each incremental surface area (pixel) of the water which are related to the pixel's sea temperature. The

received signals are fed to several channels which are tuned to separate selected frequencies. Their outputs are fed to a processor with a memory for storage. As the antenna points to pixels within a calibration area around a buoy of known coordinates, signals are likewise received and stored. Exactly measured sea temperature is received from the buoy. After passing over several calibration areas, a forward stepwise regression analysis is performed to produce an expression which selects the significant from the insignificant channels and assigns weights (coefficients) to them. The expression is used to determine the sea temperature at each pixel based on the signals received therefrom. Wind temperature, pressure, and wind speed at each pixel can also be calculated.

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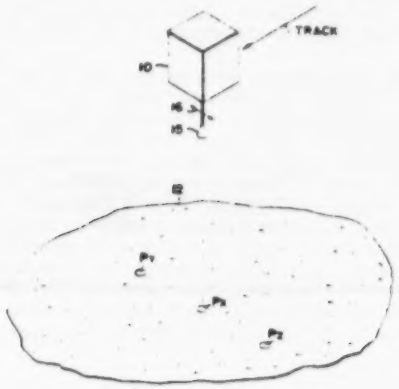

44

ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

N85-20530* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SCREEN PRINTED INTERDIGITATED BACK CONTACT SOLAR CELL Patent

C. R. BARAONA, G. A. MAZARIS, and A. T. CHAI, inventors (to NASA) 23 Oct. 1984 6 p Filed 10 Feb. 1983 Supersedes N83-20374 (21 - 10, p 1557)
(NASA-CASE-LEW-13414-1; NAS 1.71:LEW-13414-1; US-PATENT-4,478,879; US-PATENT-APPL-SN-465364; US-PATENT-CLASS-427-85; US-PATENT-CLASS-136-256)
Avail: US Patent and Trademark Office CSCL 10A

Interdigitated back contact solar cells are made by screen printing dopant materials onto the back surface of a semiconductor substrate in a pair of interdigitated patterns. These dopant materials are then diffused into the substrate to form junctions having configurations corresponding to these patterns. Contacts having configurations which match the patterns are then applied over the junctions.

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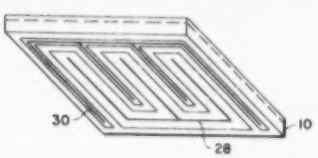


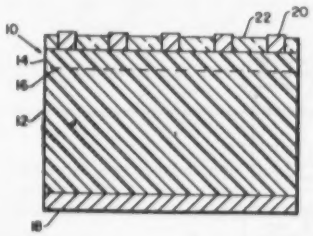
N85-20535*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LITHIUM COUNTERDOPED SILICON SOLAR CELL Patent Application

I. WEINBERG and H. W. BRANDHORST, JR., inventors (to NASA) 7 Nov. 1984 10 p
(NASA-CASE-LEW-14177-1; NAS 1.71:LEW-14177-1; US-PATENT-APPL-SN-669140) Avail: NTIS HC A02/MF A01 CSCL 10A

The resistance to radiation damage of an n(+)p boron doped silicon solar cell is improved by lithium counterdoping. Even though lithium is an n-dopant in silicon, the lithium is introduced in small enough quantities so that the cell base remains p-type. The lithium is introduced into the solar cell wafer by implantation of lithium ions whose energy is about 50 keV. After this lithium implantation, the wafer is annealed in a nitrogen atmosphere at 375 C for two hours.

NASA



N85-21768* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLAR ENERGY CONVERTER USING SURFACE PLASMA WAVES Patent

L. M. ANDERSON, inventor (to NASA) 13 Nov. 1984 7 p Filed 19 Apr. 1983 Supersedes N83-26258 (21 - 15, p 2430)
(NASA-CASE-LEW-13827-1; NAS 1.71:LEW-13827-1; US-PATENT-4,482,778; US-PATENT-APPL-SN-486470; US-PATENT-CLASS-136-246; US-PATENT-CLASS-136-225; US-PATENT-CLASS-357-30) Avail: US Patent and Trademark Office CSCL 10A

Sunlight is dispersed over a diffraction grating formed on the surface of a conducting film on a substrate. The angular dispersion controls the effective grating period so that a matching spectrum of surface plasmons is excited for parallel processing on the conducting film. The resulting surface plasmons carry energy to an array of inelastic tunnel diodes. This solar energy converter does not require different materials for each frequency band, and sunlight is directly converted to electricity in an efficient manner by extracting more energy from the more energetic photons.

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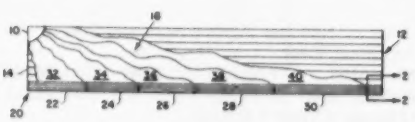

N85-21769* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOLAR POWERED ACTUATOR WITH CONTINUOUSLY VARIABLE AUXILIARY POWER CONTROL Patent

F. J. NOLA, inventor (to NASA) 18 Dec. 1984 6 p Filed 6 May 1982 Supersedes N82-26780 (20 - 17, p 2426)
(NASA-CASE-MFS-25637-1; NAS 1.71:MFS-25637-1; US-PATENT-4,489,243; US-PATENT-APPL-SN-375684;

US-PATENT-CLASS-307-64; US-PATENT-CLASS-307-66; US-PATENT-CLASS-318-46; US-PATENT-CLASS-318-729; US-PATENT-CLASS-290-1R; US-PATENT-CLASS-290-4R) Avail: US Patent and Trademark Office CSCL 10A

A solar powered system is disclosed in which a load such as a compressor is driven by a main induction motor powered by a solar array. An auxiliary motor shares the load with the solar powered motor in proportion to the amount of sunlight available, is provided with a power factor controller for controlling voltage applied to the auxiliary motor in accordance with the loading on that motor. In one embodiment, when sufficient power is available from the solar cell, the auxiliary motor is driven as a generator by excess power from the main motor so as to return electrical energy to the power company utility lines.

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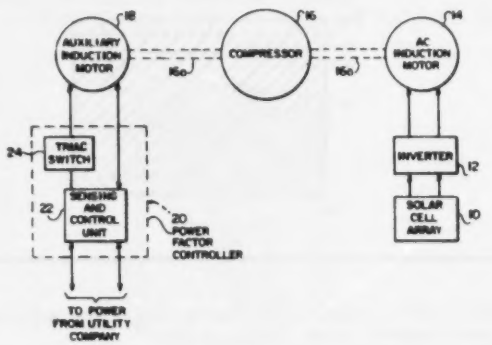

46

GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.

N85-21846* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR CALIBRATING THE IONOSPHERE AND APPLICATION TO SURVEILLANCE OF GEOPHYSICAL EVENTS Patent

P. F. MACDORAN, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 31 Jul. 1984 9 p Filed 17 Nov. 1981 Supersedes N82-26890 (20 - 17, p 2441)
(NASA-CASE-NPO-15430-1; NAS 1.71:NPO-15430-1; US-PATENT-4,463,357; US-PATENT-APPL-SN-322317; US-PATENT-CLASS-343-460; US-PATENT-CLASS-343-352; US-PATENT-CLASS-343-5W) Avail: US Patent and Trademark Office CSCL 04A

The columnar electron content of the ionosphere between a spacecraft and a receiver is measured in realtime by cross correlating two coherently modulated signals transmitted at different frequencies (L1,L2) from the spacecraft to the receiver using a cross correlator. The time difference of arrival of the modulated signals is proportional to electron content of the ionosphere. A variable delay is adjusted relative to a fixed delay in the respective channels (L1,L2) to produce a maximum at the cross correlator output. The difference in delay required to produce this maximum is a measure of the columnar electron content of the ionosphere. A plurality of monitoring stations and spacecraft (Global Positioning System satellites) are employed to locate any terrestrial event that produces an ionospheric disturbance.

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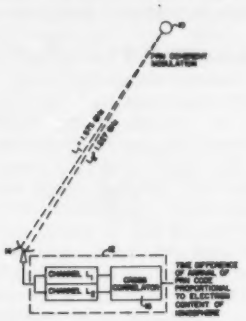


52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and weightlessness.

N85-20639*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PHOTOREFRACTOR OCULAR SCREENING SYSTEM Patent Application

J. H. KERR (Electro-Optics Consultants, Inc.) and J. R. RICHARDSON, inventors (to NASA) 28 Sep. 1984 25 p
(NASA-CASE-MFS-26011-1SB; NAS 1.71:MFS-26011-1SB; US-PATENT-APPL-SN-655605) Avail: NTIS HC A02/MF A01 CSCL 06B

A method and apparatus for detecting human eye defects, particularly detection of refractive error is presented. Eye reflex is recorded on color film when the eyes are exposed to a flash of light. The photographs are compared with predetermined standards, to detect eye defects. NASA

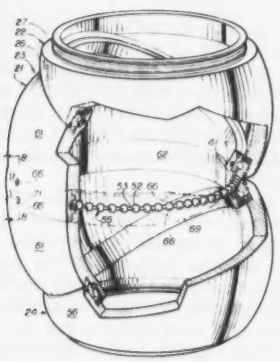
54

MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

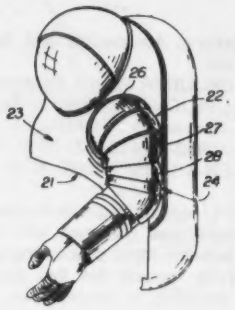
N85-20666*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ELBOW AND KNEE JOINT FOR HARD SPACE SUITS AND THE LIKE Patent Application
H. C. VYKUKAL, inventor (to NASA) 20 Dec. 1984 22 p
(NASA-CASE-ARC-11610-1; NAS 1.71:ARC-11610-1;
US-PATENT-APPL-SN-684190) Avail: NTIS HC A02/MF A01
CSCL 06K

An elbow or knee joint for a hard space suit or similar usage is formed of three serially-connected rigid sections which have truncated spherical configurations. The ends of each section form solid geometric angles, and the sections are interconnected by hermetically-sealed ball bearings. The outer two sections are fixed together for rotation in a direction opposite to rotation of the center section. A preferred means to make the outer sections track each other in rotation comprises a rotatable continuous bead chain which engages sockets circumferentially spaced on the facing sides of the outer races of the bearings. The joint has a single pivot point and the bearing axes are always contained in a single plane for any articulation of the joint. Thus flexure of the joint simulates the coplanar flexure of the knee or eblow and is not susceptible to lockup. NASA



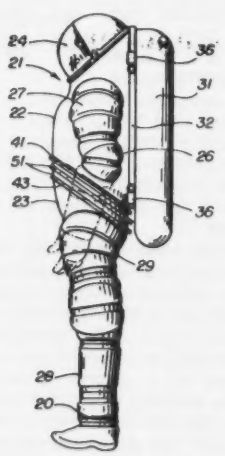
N85-21986*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SHOULDER AND HIP JOINT FOR HARD SPACE SUITS AND THE LIKE Patent Application
H. C. VYKUKAL, inventor (to NASA) 20 Dec. 1984 21 p
(NASA-CASE-ARC-11543-1; NAS 1.71:ARC-11543-1;
US-PATENT-APPL-SN-684192) Avail: NTIS HC A02/MF A01
CSCL 06K

Shoulder and hip joints for hard space suits are disclosed which comprising three serially connected truncated spherical sections, the ends of which converge. Ball bearings between the sections permit relative rotation. The proximal end of the first section is connected to the torso covering by a ball bearing and the distal end of the outermost section is connected to the elbow or thigh covering by a ball bearing. The sections are equi-angular and this alleviates lockup, the condition where the distal end of the joint leaves the plane in which the user is attempting to flex. The axes of rotation of the bearings and the bearing mid-planes are arranged to intersect in a particular manner that provides the joint with a minimum envelope. In one embodiment, the races of the bearing between the innermost section and the second section is partially within the inner race of the bearing between the torso and the innermost spherical section further to reduce bulk. NASA



N85-21987*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TORSO SIZING RING CONSTRUCTION FOR HARD SPACE SUIT Patent Application
H. C. VYKUKAL, inventor (to NASA) 20 Dec. 1984 15 p
(NASA-CASE-ARC-11616-1; NAS 1.71:ARC-11616-1;
US-PATENT-APPL-SN-684193) Avail: NTIS HC A02/MF A01
CSCL 06Q

A hard suit for use in space or diving applications has an adjustable length torso covering that will fit a large variety of wearers. The upper and lower sections of the covering interconnect so that the covering will fit wearers with short torsos. One or more sizing rings may be inserted between sections to accommodate larger torso sizes as required. Since access of the astronaut to the torso covering is preferably through an opening in the back of the upper section (which is closed off by the backpack), the rings slant upward-forward from the lower edge of the opening. The lower edge of the upper covering section has a coupler which slants upward-forward from the lower edge of the back opening. The lower section has a similarly slanted coupler which may interfit with the upper section coupler to accommodate the smallest torso size. Each ring has an upper coupler which may interfit with the upper section coupler and a lower coupler which may interfit with the lower section coupler. NASA



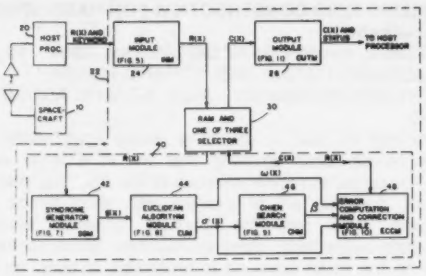
60

COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

N85-20680*# National Aeronautics and Space Administration. Pasadena Office, Calif.
REED-SOLOMON DECODER Patent Application
C. R. LAHMEYER (JPL, California Inst. of Tech., Pasadena) 21 Nov. 1984 35 p Sponsored by NASA
(NASA-CASE-NPO-15982-1; NAS 1.71:NPO-15982-1; US-PATENT-APPL-SN-673685) Avail: NTIS HC A03/MF A01 CSCL 09B

A Reed-Solomon decoder with dedicated hardware for five sequential algorithms was designed with overall pipelining by memory swapping between input, processing and output memories, and internal pipelining through the five algorithms. The code definition used in decoding is specified by a keyword received with each block of data so that a number of different code formats may be decoded by the same hardware. NASA



N85-21992* National Aeronautics and Space Administration. Pasadena Office, Calif.
AUTOMATIC MULTI-BANKING OF MEMORY FOR MICROPROCESSORS Patent
G. A. WIKER, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 6 Nov. 1984 10 p Filed 7 Aug. 1981 Supersedes N82-11785 (20 - 02, p 0250) Sponsored by NASA
(NASA-CASE-NPO-15295-1; NAS 1.71:NPO-15295-1; US-PATENT-4,481,570; US-PATENT-APPL-SN-291645; US-PATENT-CLASS-364-200) Avail: US Patent and Trademark Office CSCL 09B

A microprocessor system is provided with added memories to expand its address spaces beyond its address word length capacity by using indirect addressing instructions of a type having a detectable operations code and dedicating designated address spaces of memory to each of the added memories, one space to a memory. By decoding each operations code of instructions read from main memory into a decoder to identify indirect addressing instructions of the specified type, and then decoding the address that follows in a decoder to determine which added memory is associated therewith, the associated added memory is selectively enabled through a unit while the main memory is disabled to permit the instruction to be executed on the location to which the effective address of the indirect address instruction points, either before the indirect address is read from main memory or afterwards, depending on how the system is arranged by a switch.
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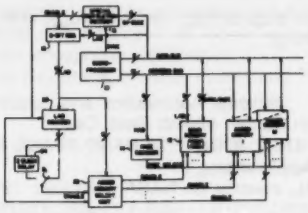

71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

N85-22104* National Aeronautics and Space Administration. Pasadena Office, Calif.
ACOUSTIC AGGLOMERATION METHODS AND APPARATUS Patent
M. B. BARMATZ, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 9 Oct. 1984 7 p Filed 24 Mar. 1982 Supersedes N82-27087 (20 - 17, p 2469) Sponsored by NASA
(NASA-CASE-NPO-15466-1; NAS 1.71:NPO-15466-1; US-PATENT-4,475,921; US-PATENT-APPL-SN-361217; US-PATENT-CLASS-23-313R; US-PATENT-CLASS-55-15; US-PATENT-CLASS-55-277) Avail: US Patent and Trademark Office CSCL 20A

Methods are described for using acoustic energy to agglomerate fine particles on the order of one micron diameter that are suspended in gas, to provide agglomerates large enough for efficient removal by other techniques. The gas with suspended particles, is passed through the length of a chamber while acoustic energy at a resonant chamber mode is applied to set up one or more acoustic standing wave patterns that vibrate the suspended particles to bring them together so they agglomerate. Several widely different frequencies can be applied to efficiently vibrate particles of widely differing sizes. The standing wave pattern can be applied along directions transversed to the flow of the gas. The particles can be made to move in circles by applying acoustic energy in perpendicular directions with the energy in both directions being of the same wavelength but 90 deg out of phase.
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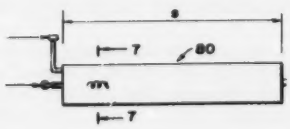

N85-22105* National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGH TEMPERATURE ACOUSTIC LEVITATOR Patent

M. B. BARMATZ, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 7 Aug. 1984 10 p Filed 26 Aug. 1983 Supersedes N83-36847 (24 - 24, p 4033) Sponsored by NASA (NASA-CASE-NPO-16022-1; NAS 1.71:NPO-16022-1; US-PATENT-4,463,606; US-PATENT-APPL-SN-526750; US-PATENT-CLASS-73-505) Avail: US Patent and Trademark Office CSCL 20A

A system is described for acoustically levitating an object within a portion of a chamber that is heated to a high temperature, while a driver at the opposite end of the chamber is maintained at a relatively low temperature. The cold end of the chamber is constructed so it can be telescoped to vary the length (L sub 1) of the cold end portion and therefore of the entire chamber, so that the chamber remains resonant to a normal mode frequency, and so that the pressure at the hot end of the chamber is maximized. The precise length of the chamber at any given time, is maintained at an optimum resonant length by a feedback loop. The feedback loop includes an acoustic pressure sensor at the hot end of the chamber, which delivers its output to a control circuit which controls a motor that varies the length (L) of the chamber to a level where the sensed acoustic pressure is a maximum.

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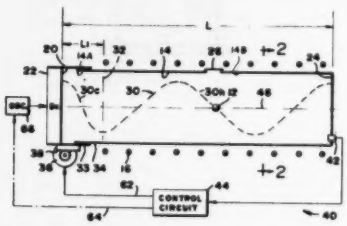


74

OPTICS

Includes light phenomena.

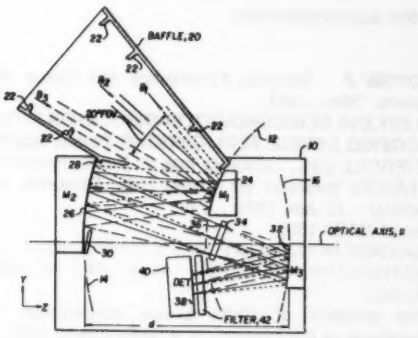
N85-20868*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

WIDE-ANGLE FLAT FIELD TELESCOPE Patent Application

K. L. HALLAM, B. J. HOWELL, and M. E. WILSON, inventors (to NASA) 5 Feb. 1985 16 p (NASA-CASE-GSC-12825-1; NAS 1.71:GSC-12825-1; US-PATENT-APPL-SN-698641) Avail: NTIS HC A02/MF A01 CSCL 20F

An unobscured three mirror wide-angle telescopic imaging system comprised of an input baffle which provides a 20 deg. (Y axis) x 301 deg. (X axis) field of view, a primary mirror having a convex spherical surface, a secondary mirror having a concave ellipsoidal reflecting surface, and a tertiary mirror having a concave spherical reflecting surface. The mirrors comprise mirror elements which are offset segments of parent mirrors whose axes and vertices commonly lie on the system's optical axis. An iris diaphragm forming an aperture stop is located between the secondary and tertiary mirror with its center also being coincident with the optical axis and being further located at the beam waist of input light beams reflected from the primary and secondary mirror surfaces. At the system focus, following the tertiary mirror, is located a flat detector which may be, for example, a TV imaging tube or a photographic film. When desirable, a spectral transmission filter is placed in front of the detector in close proximity thereto.

NASA



N85-22139* National Aeronautics and Space Administration. Pasadena Office, Calif.

FOCAL PLANE ARRAY OPTICAL PROXIMITY SENSOR Patent

A. R. JOHNSTON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 23 Oct. 1984 11 p Filed 11 Mar. 1981 Supersedes N81-22894 (19 - 13, p 1834) Sponsored by NASA (NASA-CASE-NPO-15155-1; NAS 1.71:NPO-15155-1; US-PATENT-4,479,053; US-PATENT-APPL-SN-242797; US-PATENT-CLASS-250-221; US-PATENT-CLASS-340-555) Avail: US Patent and Trademark Office CSCL 20F

An optical proximity sensor for optically detecting an object within a predetermined detection volume is described. More specifically, an optical proximity sensor is disclosed having an illuminator assembly including lens and a plurality of light-emitting diodes located at first predetermined positions along the focal plane of the illuminator lens. A detector assembly including a detector lens and a plurality of photodiodes located at second predetermined positions along the focal plane of the detector lens is also provided. The two lenses are spaced apart a predetermined distance in order to define a predetermined detection volume. Additionally, a combination of optical proximity sensors, according to the invention, is disclosed wherein the sensors can be used in conjunction with a vehicle to provide a safety system for warning an operator when an object is within a volume defined by the proximity sensor combination.

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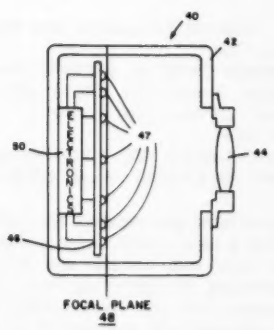

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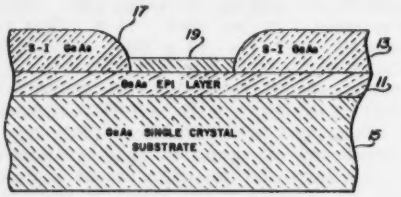
SOLID-STATE PHYSICS

Includes superconductivity.

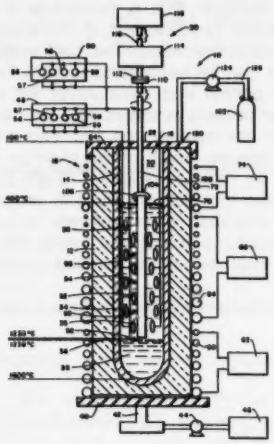
N85-20906*# National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW STRESS SEMICONDUCTOR-INSULATOR INTERFACE FOR CRYOGENIC DEVICE APPLICATIONS Patent Application
G. SHERRILL (JPL, California Inst. of Tech., Pasadena) and R. J. MATTAUCH, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) 10 Jan. 1985 8 p
(Contract NAS7-100)
(NASA-CASE-NPO-16394-1; NAS 1.71:NPO-16394-1; US-PATENT-APPL-SN-690284) Avail: NTIS HC A02/MF A01 CSCL 20L

The problem of GaAs device degradation at cryogenic temperatures at the interface of a GaAs device layer and openings in an overlying SiO2 passivation layer is addressed. This problem is solved by providing a semi-insulating GaAs passivation layer epitaxially grown on the underlying GaAs device layer. This structure provides a lattice-matched passivation layer not subject to severe mechanical stress at cryogenic temperatures. NASA



N85-22178*# National Aeronautics and Space Administration. Pasadena Office, Calif.
TOTAL IMMERSION CRYSTAL GROWTH Patent Application
A. D. MORRISON, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) 21 Nov. 1984 20 p
(Contract NAS7-100)
(NASA-CASE-NPO-15800-2; NAS 1.71:NPO-15800-2; US-PATENT-APPL-SN-674395) Avail: NTIS HC A02/MF A01 CSCL 20B

Crystals of wide band gap materials are produced by positioning a holder receiving a seed crystal at the interface between a body of molten wide band gap material and an overlying layer of temperature-controlled, encapsulating liquid. The temperature of the layer deceases from the crystallization temperature of the crystal at the interface with the melt to a substantially lower temperature at which formation of crystal defects does not occur, suitably a temperature of 200 C to 600 C. After initiation of crystal-growth, the leading edge of the crystal is pulled through the layer until the leading edge of the crystal enters the ambient gas headspace which may also be temperature controlled. The length of the column of liquid encapsulant may exceed the length of the crystal such that the leading edge and trailing edge of the crystal are both simultaneously with the column of the crystal. The crystal can be pulled vertically by means of a pulling-rotation assembly or horizontally by means of a low-angle withdrawal mechanism. NASA



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	10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, DC 20546	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

Section 1: Abstracts

16. Abstract

Abstracts are provided for 92 patents and patent applications entered into the NASA scientific and technical information system during the period January 1985 through June 1985. Each entry consist of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application.

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ILLINOIS STATE LIBRARY
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Boston, MA 02117
(617) 536-5400 ext. 226

DETROIT PUBLIC LIBRARY
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Detroit, MI 48202
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Minneapolis, MN 55455
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Documents Division
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OKLAHOMA DEPT. OF LIB.
Government Documents
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Oklahoma City, OK 73105
(405) 521-2502

OKLAHOMA STATE UNIV. LIB.
Documents Department
Stillwater, OK 74078
(405) 624-6546

PORTLAND STATE UNIV. LIB.
Documents Department
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Portland, OR 97207
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Government Pub. Section
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Harrisburg, PA 17105
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Austin, TX 78753
(512) 471-2996

TEXAS TECH UNIV. LIBRARY
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